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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

INSTITUTE for RESEARCH in LAND ECONOMICS PUBLIC UTILITIES
"UNDER ALL" "THE LAND"

PROBLEMS OF RURAL ELECTRIC SERVICE: THE POTENTIAL MARKET
HANINA ZINDER

TRENDS IN THE AGRICULTURE OF THE HARD WINTER WHEAT BELT
W. E. GRIMES

INTEGRATION OF WISCONSIN ELECTRIC PLANTS
E. O. MALOTT

SHOULD BARE-LAND VALUES BE TAXED MORE HEAVILY?
HARRY GUNNISON BROWN

REAL ESTATE ACTIVITY IN CHICAGO ACCOMPANYING THE WORLD'S FAIR OF 1893
H. MORTON BODFISH

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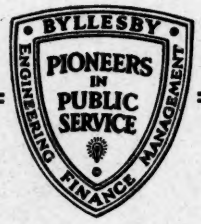

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CONTENTS FOR NOVEMBER, 1928

Problems of Rural Electric Service: The Potential Market. HANINA ZINDER 337

Trends in the Agriculture of the Hard Winter Wheat Belt. W. E. GRIMES 347

Integration of Public and Private Electric Plants in Wisconsin ..... E. O. MALOTT 355

The Philadelphia Building and Loan Association Plan of Financing by Second Mortgages ..... W. N. LOUCKS 367

Should Bare-Land Values Be Taxed More Heavily? ..... HARRY GUNNISON BROWN. 375

A Study of Utility Financial Structures: Capital Investments and Sources of Capital ..... A. H. WINAKOR 393

Real Estate Activity in Chicago Accompanying the World's Fair of 1893 ..... H. MORTON BODFISH 405

The Pre-Ownership Steps on the "Agricultural Ladder" in a Low Tenancy Region ..... CARL F. WEHRWEIN 417

Departments Page 426

Summaries of Research 427

Comments on Legislation and Court Decisions 431

Book Reviews 433

Current Literature Notices 437

Index to Volume IV 441

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THE JOURNAL OF
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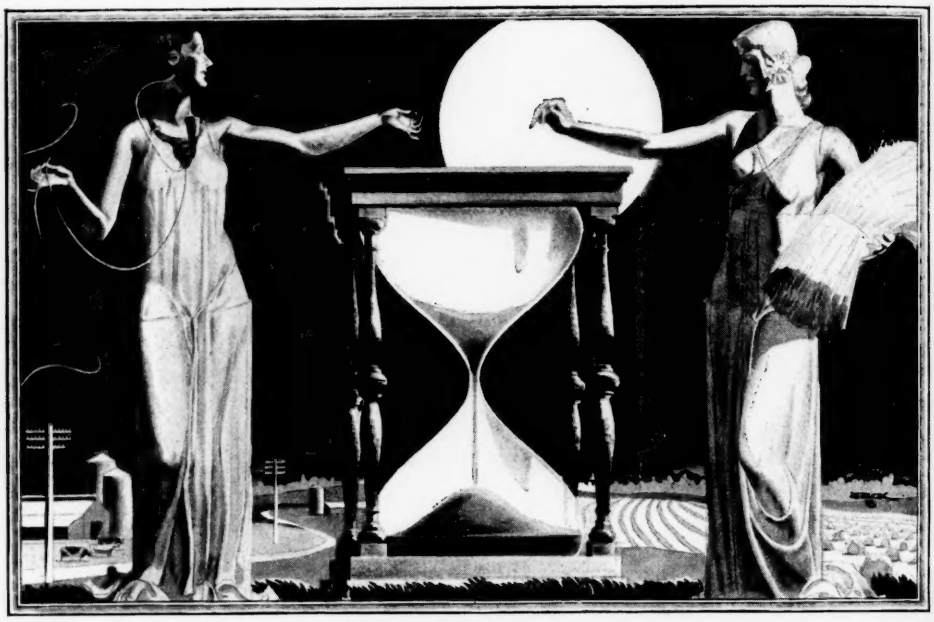

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PROBLEMS OF RURAL ELECTRIC SERVICE: THE POTENTIAL MARKET

By HANINA ZINDER*

IMAGINATIVE enthusiasts for rural electrification have leaped to many ill-considered conclusions regarding both its social and its economic possibilities. On the other hand, some still refuse to consider the problem as having importance. However, there is a manifest demand for such service which must be considered.

Conceivably, some farms are so far removed and isolated from centers of electrical distribution as to be economically out of reach of central station service. These will have to depend upon individual plants if electric service is desired. Considering, then, that only 30%[1] of the farms of the country are potential customers, one is confronted with the fact that it will require 700,000 miles of rural distribution lines to serve them, using the accepted average of 3 customers per mile as a standard. At a representative cost of $1,000 per mile, these lines will require an investment of no less than $700,000,000. But to this line extension cost must be added at least an equal amount for local equipment costs such as transformers, service extensions, meters and other equipment to enable use of the service. Thus, with reasonable and conservative estimates, it is evident that rural electrification within the limits of present technology will require at least the significant sum of $1,500,000,000 of capital expenditures.

Many people regard the electrified farm as one effective means of stemming the migration of farmers to the city. In making farm life more attractive, no doubt, such a tendency exists. But, on the other hand, it may serve perma-

*Editorial Note: This is the first of two articles on the problems of rural electric service. The second article, which will appear in the February issue of the *Journal*, will deal with the financing of rural line extensions and rural rate schedules. These articles are the author's attempt to analyze and interpret impartially the fundamental economic principles involved in the problems of rural electric service from the point of view of the utility as well as the farmer.

[1] The estimated 30% is that admitted and commonly assumed by leaders in the field of rural electrification, as being the ultimate extent of farm electric service as supplied by central station companies, based upon the present state of development in electrical distribution.

nently to raise the standard of living on the farm so that those farmers not able to afford electric service will leave. In the opinion of some agricultural economists this latter tendency would be the more desirable. It would result in a natural limitation of the supply of farm products until farm prices had risen high enough to allow the farmer to live up to this new standard. This, however, could only come about slowly and would cover a long period of time.

Moreover, electricity applied in the farm home will unquestionably relieve much of the drudgery of house work. With the additional chores that are the duty of the farmer's wife, this drudgery has been far more exhausting than in the city dwelling. Hence, a happier and more contented farmer invariably results from the use of electricity on the farm.

It would seem, then, from the point of view of the investment required and the vast field of possibilities for the application of electrical power together with the social significance of such service, that rural electrification is a problem of considerable importance and magnitude. This social significance can not be measured in dollars and cents, but it is serving to make electricity on the farm a social necessity. It is, in reality, the driving force behind all efforts to seek ways and means to place rural electric service upon a profitable basis to the farmer.

Furthermore, the latest census figures reveal the fact that 48% of the entire population of the country reside in rural districts,[2] of which the farmer makes up 28% to 30% of the total. For the most part these residents are without electric service. Yet a recent survey of the primary power used in agriculture made by the United States Department of Agriculture shows the farmer group as being one of the largest primary power users in the country. With the aid of this power the farmer has been able to increase his volume of production over three times what it was 75 years ago. Here, then, is a vast field of expansion as yet only slightly entered by electrical power.

History

Although rural electrification is still in its developmental and experimental stage, it has passed its infancy for it dates back to the very beginnings of the electric light and power industry. In 1879 two Frenchmen invented and exhibited an electric plow which actually operated, but was soon abandoned and forgotten.[3] The time had not arrived for its practical consideration since the generation, distribution, and utilization of electric power was still in its early stages of development. But even in this period it was generally recognized that there could be no great immediate profits from such service. The city with its factories and possibilities of centralized load presented the natural and logical starting point for electric service. In the rapid development of the industry that followed the farmer was forgotten.

Some 40 years later the industry had reached the point where its interconnected transmission lines formed a veritable network over the country. Farmers viewed these high voltage transmission lines, which in many instances passed over their own property, as the means of bringing electricity to their homes. The demand for service then grew to the point where central station

[2] "In drawing the distinction between urban and rural population, all incorporated places (and all towns in Massachusetts, Rhode Island, and New Hampshire) having 2500 inhabitants or more are treated as urban and the remainder of the country as rural." 14th Census of the United States, 1920, Vol. 1.

[3] "A Milestone Passed in Rural Electric Service." E. A. White—*National Electric Light Association Bulletin*, Sept., 1925.

managers realized it could no longer go unheeded. To tap these high tension lines at a cost of $40,000 to $50,000 for each group of farmers was not economically possible, hence it became necessary to inform the farmer of these facts and commence an investigation of the problem. At the same time that the above developments were occurring in California, where considerable power was in demand for irrigation and drainage, rural service offered a really profitable field of expansion that led to its earlier development. This caused renewed widespread interest throughout the country. In 1920 the National Electric Light Association appointed a committee known as the Rural Lines Committee to investigate and study the problem. However, for the most part, utilities were still very hesitant in extending rural service and, in order to cover the high investment per customer, charged what were really high rates. This caused considerable controversy and antagonism between the farmers and utilities supplying the service.

At this time surveys showed that approximately 500,000 out of the 6,500,000 farms in this country had electric service, of which 1½% were supplied by means of individual lighting plants. Furthermore, analysis began to be made of costs, rates, distribution, load-factors, and the relative advantages and disadvantages to both the utility and the farmer. All indicated that cooperation was imperative if a solution was to be expected.

Therefore, in 1923, the Committee on the Relation of Electricity to Agriculture was founded. This Committee to-day consists of representatives of all the leading farm and utility organizations, manufacturers of electrical and farm equipment, and the United States Departments of Agriculture, Commerce, and the Interior. Its purpose has been to ascertain the facts of the problem and gain the cooperation of all those interested. In over 20 states subcommittees were formed to build experimental farm lines and study the existing problems and possibilities of rural electric service. The result has been that many electric light and power companies with large rural territory have set up agricultural engineering departments to study and supervise the installation of farm lines.[4] However, while progress is in evidence, as yet the problem raises many questions that need to be answered.

The Market for Service[5]

An analysis of the market for electric energy outside of cities and large towns reveals three distinct groups, namely, (1) small outlying hamlets, (2) rural industries, and (3) farms, plantations, and ranches. The third group is that about which we are chiefly concerned, but the first two play an important part whenever they appear. Electrification of these hamlets and rural industries, such as quarries, brick and tile works, creameries and canneries, brings the distribution lines farther into the farm territory. These lines are normally at voltages which would permit tapping for farm extensions along the route. In the same manner, the present tendency toward highway lighting bears an important relation to rural service. However, the market for service presented by these rural industries and even highway light-

[4] A recent survey shows that 57 companies have established rural service departments and 43 others have trained men in charge. National Electric Light Association, *Proceedings*, 1927, Vol. 84, p. 83, Report of Rural Electric Service Committee.

[5] In this consideration of the market for electric service the farm power requirements are principally discussed. It is recognized that from the central station point of view a profitable load may be built up from household uses alone, principally through the use of the electric range and refrigerator.

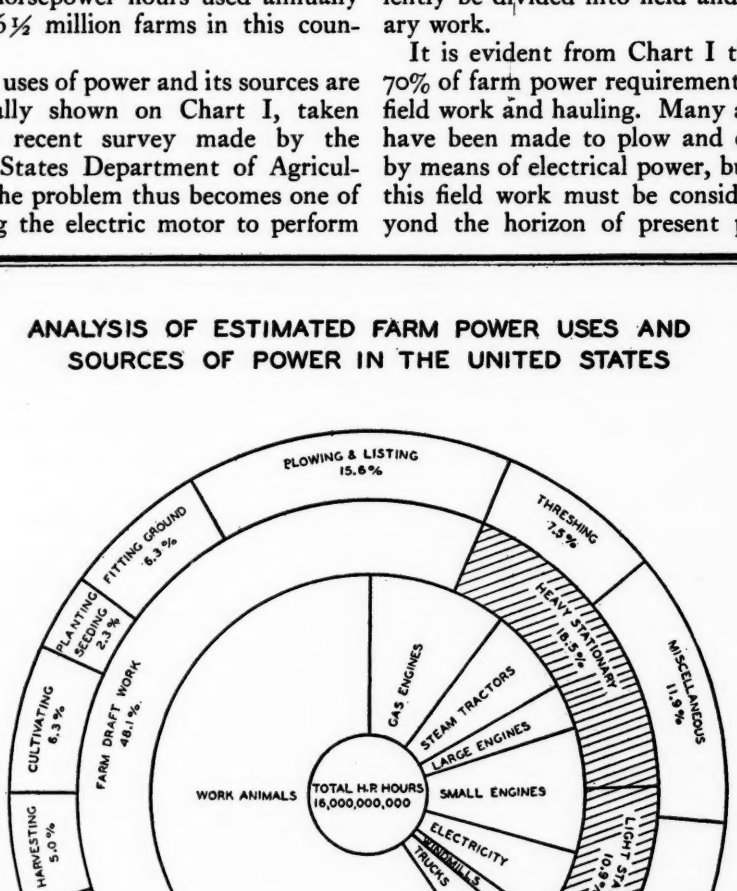
ing is small when compared to the 16 billion horsepower hours used annually on the 6½ million farms in this country.

Farm uses of power and its sources are graphically shown on Chart I, taken from a recent survey made by the United States Department of Agriculture. The problem thus becomes one of adapting the electric motor to perform the farmer's work which can conveniently be divided into field and stationary work.

It is evident from Chart I that over 70% of farm power requirements are for field work and hauling. Many attempts have been made to plow and cultivate by means of electrical power, but as yet this field work must be considered beyond the horizon of present practica-

CHART I

ANALYSIS OF ESTIMATED FARM POWER USES AND SOURCES OF POWER IN THE UNITED STATES



Adapted from "An Appraisal of Power Used on Farms in the United States", United States Department of Agriculture, *Bulletin No. 1348*, p. 5.

bility. The extent of the possibilities remaining is shown cross-hatched on Chart I and amounts to approximately 5 billion horsepower hours annually. This work would include threshing, pumping for irrigation and drainage, and various miscellaneous operations, such as grinding feed, baling hay, shelling corn, cutting ensilage. This classification does not include household uses. Already part of this work is motorized on electrified farms, but still much has to be done before generally satisfactory results are obtained.

The difficulties encountered in using the electric motor for this stationary work are that it must be portable and adapted to the speed of the farm equipment. To install permanently an electric motor for each task that may require but one hour a day or but several days out of the year is expensive. Then, too, for best efficiencies, the electric motor runs at high speed, whereas farm equipment must run at slow speed. A number of portable farm motors are on the market, but in many cases they require more than average ingenuity from the farmer to be able to fasten the motor for each operation and belt it properly. Much has been promised for standardizing farm equipment suitable for the electric motor, but progress is slow. However, the electric motor has its advantages which the farmer readily appreciates when he has the task of starting his gasoline engine on a cold winter morning. Assuming, nevertheless, complete electrification of this type of work, its possibilities as a market for electric service present interesting problems.

The figure of 5 billion horsepower hours appears large, but when distributed over 6½ million farms it results in an average of 45 kilowatt hours per farm per month. Certainly such a load is neither large nor attractive. Admittedly, this figure is only an average and will vary considerably with the size, type, and location of the farm itself. These variations from the average are important and need further study. A further computation of the averages by individual states strikingly brings out this variance and is shown in Table I.

TABLE I. ESTIMATED FARM POWER LOAD*

State	H. P. Hours (Thousands)†	Number of Farms	Annual H. P. Hours per Farm	Monthly K.W. Hours per Farm
Arizona	29,000	9,900	2,930	*182.0*
North Dakota	225,000	77,700	2,900	*180.1*
New Mexico	80,000	29,800	2,680	*167.0*
South Dakota	185,000	74,700	2,480	*154.0*
Idaho	88,000	42,100	2,090	*130.0*
Montana	115,000	57,700	2,000	*125.0*
Washington	126,000	66,300	1,900	*118.0*
Oregon	85,000	50,200	1,690	*105.0*
Iowa	354,000	213,439	1,660	*103.0*
Nebraska	205,000	124,400	1,650	*103.0*
Illinois	335,000	237,200	1,420	*88.5*
Colorado	82,000	59,900	1,370	*85.5*
Minnesota	239,000	179,478	1,330	*83.0*
Kansas	220,000	165,000	1,330	*83.0*
Wyoming	19,000	15,700	1,210	*75.5*
Utah	26,000	25,700	1,010	63.0
Wisconsin	184,000	189,300	970	60.5
New York	164,000	193,000	850	53.0
New Jersey	24,000	29,700	810	50.5
Indiana	160,000	205,126	780	48.5
Ohio	199,000	256,700	775	48.5
California	925,000	117,700	785	48.5
Pennsylvania	154,000	202,200	760	47.5
Louisiana	100,000	135,500	740	46.0
Rhode Island	3,000	4,100	730	45.5
Michigan	140,000	196,500	715	44.5
Delaware	7,000	10,100	685	42.6
Oklahoma	124,000	192,000	645	40.5
Massachusetts	20,000	32,000	625	39.0
Connecticut	14,000	22,700	620	38.6
Missouri	159,000	263,000	605	37.7
Texas	263,000	436,000	600	37.4
Maryland	28,000	47,900	585	36.4
Vermont	16,000	29,100	550	34.2
New Hampshire	9,000	20,500	440	27.4
Florida	21,000	54,000	390	24.3
Maine	17,000	48,200	350	21.8
Arkansas	82,000	232,600	350	21.8
Virginia	56,000	186,200	300	18.7
South Carolina	49,000	192,700	250	15.6
West Virginia	20,000	87,300	230	14.3
Tennessee	50,000	252,800	200	12.5
Georgia	58,000	310,700	190	11.8
Kentucky	50,000	270,600	185	11.5
North Carolina	43,000	269,800	160	10.0
Nevada	5,000	3,200	155	9.7
Mississippi	37,000	272,100	136	8.5
Alabama	30,000	256,100	120	7.5
Total	5,624,000	6,448,600	957	59.6 (Av.)

* Compiled from United States Department of Agriculture, *Bulletin* No. 1348, July, 1925.

† Includes power used by tractors, stationary engines, windmills, and electric power. (The electric power included is only a fractional part of the total.)

It would appear that normally in only 15 states—Arizona, North Dakota, New Mexico, South Dakota, Idaho, Montana, Washington, Oregon, Iowa, Nebraska, Illinois, Colorado, Minnesota, Kansas, and Wyoming, (indicated in the table by italics)—would electrification of this part of the farm work build up a desirable load.[6] It is recognized that even these figures are rough averages and possibly contrary to common opinion, but, even so, they should form sufficient basis for questioning whether electrification of these farm power requirements in themselves will supply a sufficient load on the farm for profitable use of electric service. Furthermore, the above estimates assume a complete supplanting of the small and large engines and steam tractors on the farms, which is really only a possibility.

The bird's-eye view of the market for farm electric service as discussed above is, perhaps, over-pessimistic. The size, type and geographical location of the farms in the country (all interdependent factors) change the complexion of the problem and hold forth hope of success in a more limited field.

It is known that farms tend to be smaller and more intensively used near the city, while farms 15 to 20 miles out raise general crops. Furthermore, it has been found that these small farms are frequently the most profitable and are of the dairy, poultry, small grain and live stock type. Table II shows clearly the constant fall in the number of electrified farms as distance to the market increases.

[6] It is obvious that these states are principally those that are sparsely settled. Perhaps a better yardstick would be kilowatt-hours per farm per acre. However, the author feels that for present purposes, eliminating household uses, this analysis is sufficient. The complete analysis of the potential market is obtained only when the discussion following on the location and type of farm is considered together with the above facts.

TABLE II. DISTANCE TO MARKET OF 324 ELECTRIFIED FARMS*

Miles to Market	Number of Farms
1	63
2	68
3	69
4	45
5	39
6	10
7	10
8	6
9	5
10	3
11	2
12	2
13	0
14	2

* "Present Status of Rural Electrification of Kansas," *Engineering Experiment Station Bulletin* No. 16, Kansas State Agricultural College, pp. 10 and 25 (July 1, 1925).

An interesting point is seen in the sharp drop between 5 and 6 miles to the market. Fortunately these small farms close to the market are generally more profitable even though they are often found to be short of cash on hand for the running of the farm or for investment purposes. These farms are of the type that lend themselves to profitable electrification and are the logical starting point of rural service. Their yearly power requirements may be small, but they are uniform and in small units as compared to the larger farms where the principal power requirement is for field work for which satisfactory electrical drives are not yet available. Results of an estimate made and reported in the Giant Power Survey[7] show the kilowatt hours used monthly on various types of farms (Table III).

The figures in Table III are estimates of the probable use in the present stage of the development of equipment as a result of a detailed analysis based on wide experience and include the total estimated use of power on the field and in and around the home and barn. Com-

[7] Commonwealth of Pennsylvania, Report of the Giant Power Survey Board, p. 279 (February, 1925).

pared with results of actual installations, these estimates have proved to be rather high, but they still indicate the variations that can be expected between different types of farms in their use of power.

TABLE III. ESTIMATED USE OF ELECTRICITY IN DIFFERENT TYPES OF FARMS OF VARYING SIZES

Type and Size of Farm	Kilowatt-Hours
Dairy Farm	
20 cows	265
50 cows	408
100 cows	880
Poultry Farm	
500 hens	276
1000 hens	391
1500 hens	572
Stock Farm	
20 animal units	197
50 animal units	247
100 animal units	367
Grain Farm	
25 acres oats and 25 acres corn	187
50 acres oats and 50 acres corn	227
100 acres oats and 100 acres corn	290
Fruit Farm	
20 acres	170
50 acres	175
Market Garden	
10 acres and 3—200 ft. x 300 ft. glass houses	450

Over-enthusiasm has often arisen with regard to rural electrification because of the rapid increase of electrified farms in the past few years. Investigation reveals, however, that the bulk of the progress has been made in rich dairy farm districts or on small farms near large central markets. Furthermore, a review of the principal uses of electric service on these farms shows that only a very small percentage have other than household appliances and perhaps one small utility motor. Apparently, even where the electric motor has finally been adapted technically to various operations, its economical usefulness is yet unsolved.[8] This problem is made more difficult because of the lack of standardization of farm methods, because it often means scrapping a present investment for a new one, and, finally, because of the inertia of farmers in grasping anything new. Not until the electric motor is adapted to present farm work in such a manner as to be economically feasible can the problem be considered solved.

Yet the list of applications of electricity on farms has grown into the hundreds. Constantly new uses are found, some of which have proved economical, e. g., electrically lighting the hen house to get greater egg production and using ultra-violet ray lamps to prevent leg-weakness among chicks. No attempt will be made here to present a complete list of equipment that may be in use on various farms, but a few of the more common applications outside the farm home are as follows:

Wood sawing
Pumping irrigation water
Ensilage cutters and blowers
Hay hoists
Corn shellers
Green feed choppers
Milking machines, cream separators, churns, etc.
Hullers and viners
Electric incubators and brooders
Electric drill
Grain elevator

For the most part, the uses of electricity in the farm home are similar in all respects to its uses in the city. The electric iron, washing machine, vacuum cleaner, toaster, percolator, range, and refrigerator, are all found in the farm

[8] To be economically useful, the farm motor must perform more than one task in such a manner as to allow for the complete elimination of the present power source, or release labor for other useful employment at the same time. If an additional motor is to be used for each task, it should, then, net a saving at least sufficient to care for the fixed charges on the additional investment.

home though generally in decreasing percentages in the order named. Here again it must not be overlooked that equipment in use in the small city apartment or home is not always suitable to the needs of the large farm home.

Obviously the extent of the probable future use of electric power on farms is, at best, very problematical. Opinions vary considerably and it is easy to find extremely optimistic views making predictions such as "Automatic Plow to Make Farming One Sweet Song,"[9] or others expressing considerable doubt—"I wish it were possible for me to hold out the hope that electricity could supply this vast power for the farmers and so by putting greater power back of the worker on the farm, as it does in industry, diminish the cost of production and increase the earning power of the worker. In the present stage of the electrical art, electricity cannot hope to supply a large percentage of the farmer's power."[10]

Apparently for a few years to come the market for electric service on farms will be chiefly for household purposes. Complete electrification must still await further developments in the electric art or the operation of such long-time trends as decentralization of industry, highway lighting, etc.

In the present day of increasing numbers of consolidations and mergers in industry it would appear unreasonable to place any hope in a tendency toward decentralization of industry as aiding in rural electrification. Nevertheless, the rapid strides toward cheaper generation and transmission of electric power are making more feasible the location of small industries close to the supply of raw material or of labor. And publicists are already calling attention to the tendency. ". . . if small factories can ultimately be planted throughout the agricultural regions of America, absorbing and utilizing as raw materials many of the main products and certainly all of the waste products of the American farm, then we may get a double outlet for human energy that will absorb in the factory the present seasonal idleness of farm labor to an extent that will put a sound economic foundation under agricultural regions without the succor of government subsidy."[11] In England the industrialized farm is being experimented with as a possible means of making profitable a great many of the losing farms and bringing into productivity much of its land that is at present too poor itself to be worked profitably.[12] Obviously, industrializing the farm or the decentralization of industry will go a long way toward solving the problem of rural electrification. While these movements are still in the incipient stage, they are of such significance as to warrant consideration.

The Supply of Service

Certainly the prospect of residential customers three to a mile in the country is not an encouraging one for development, when compared to 50 to 100 per mile in the city. Briefly stated, the whole problem of supply of service centers around the difference in the length of distribution system necessary to service the same number of customers on rural and urban extensions. This results in a cost of distribution system of $50 per urban customer as compared to ap-

[9] Frank Ridgway, "Automatic Plow to Make Farming One Sweet Song," *The Chicago Tribune*, December, 1925.

[10] Owen D. Young, "Making the Load Lighter by Electricity." Committee on the Relation of Electricity to Agriculture (December 28, 1925).

[11] Glenn Frank, "Power, the Background of our Present Day Civilization." 50 *Mechanical Engineer*, p. 278 (April, 1928).

[12] W. Beach Thomas, "The Coming of the Factory Farm." 99 *19th Century*, 824 (June, 1926).

proximately $400 per rural customer. Furthermore, it is necessary usually to install a separate transformer for each farmer. This not only increases the cost, but because of the farmer's poor load-factor, losses of energy have been found in many cases to be equal in amount to that actually used.[13] The final result is a high investment per customer coupled with high maintenance expenses and with but a small load to furnish revenue.

It is now generally accepted as being impractical to tap transmission lines above 15,000 volts for ordinary rural loads. Transmission lines 15,000 volts and under, then, can be considered points of origin for local distribution lines to the farmer. Various types of poles, wires, and equipment have been studied to reduce the cost of farm line extensions, but certain minimum standards of safety are necessary that do not allow much reduction in cost.[14] In some cases underground construction has been attempted, but as yet it has not proved entirely practical for most installations. Hence, an additional investment of approximately $400 is necessary to serve each farmer as compared with serving an average domestic city customer. Added to this are the costs of wiring the farm home and barn, purchasing equipment for utilizing this service, and, finally, bringing the service in from the line along the road to the farm house itself. The sum of all these costs, which becomes the investment necessary per farmer to gain and be ready to use electric service, will vary approximately from $1200 to $1500. At present this investment would pay the farmer little or no financial returns directly, though it sometimes enables him to dispense with some hired help.

Many electric supply companies in attempting to reduce the large initial investment necessary have built farm line extensions at their own expense and then charged higher rates to cover the fixed charges thereon. On the surface this is not an attractive investment for the public utility. With the present status of utility regulation which allows only an almost fixed and limited return on the investment in property and plant, little incentive is offered to a company to pioneer in the development of a new business. The electric light and power companies then require assurance of a return upon the investment made from the outset. Furthermore, this return must be reasonably assured for a number of years to safeguard properly the large investment.

This problem of who should make the investment in rural line extensions or what rate should be charged is more than one of allocated costs and finance, for it has social and political aspects as well. The monopolistic nature of the electric light and power industry and its peculiar relation to the consuming public gives to its problems and actions a general public interest. On the other hand, the essentiality of agriculture makes the farmers' problems also of general social significance. These facts were early realized in foreign countries where rural electric service is generally subsidized fully or in part. Hence, there is

[13] At the present time little consideration is given to the increase in plant capacities that will be necessary to take on the rural load. Some surveys have been made, however, of the farm load and diversity factors. In the long run greater consideration and study will be necessary although the wide distribution of the farms may serve to make each local increase in plant capacity almost negligible.

[14] The Milwaukee Electric Railway and Light Company has been able to reduce its costs of rural line extensions almost 40% principally by almost doubling the spacing of poles. ("Rural Electric Service," by G. W. Van Derzee, Oct., 1928. Pamphlet printed by the Association of Edison Illuminating Cos.) Even so, their costs as shown per mile of line are not much below those of other companies.

always the possibility in this country that, if utilities do not face the problem squarely, some one may make a "political football" out of the slightest disagreement, or may seek other agencies than the privately owned central stations for rendering rural service. A political turn of events would, in the opinion of those in the industry, certainly not assist the permanent and satisfactory solution of the problem. But these factors warrant mention to show that the rural electrification problem involves not only engineering but political and social relationships which are perhaps even more important.

However, the critical period is passed and farmers are generally satisfied that utilities are exerting reasonable efforts in their plans for promoting rural service. It seems reasonable to expect that for the time being the successful spread of rural service is dependent upon the initiative of the power company in aggressively selling this service under carefully studied and constructed plans of financing such extensions and rate schedules.[15] Where such efforts have been made, rural electric service is most widespread and has been found to be even a profitable business to the company. Farmers must cooperate as well, so that all those along a proposed rural line take service and thus reduce to a minimum the cost of such service per farmer. The future growth and intensive use of rural service will depend upon engineering developments now in progress and bound to come once service is installed.

[15] "In other words, in the majority of cases, the service has been extended to the farmer only after a very careful study has been made beforehand by the company after the farmer has asked for it." "What Electricity Means to the Farmer," by M. L. Noon, National Electric Light Association, *Proceedings*, 1927, Vol. 84, p. 95.

TRENDS IN THE AGRICULTURE OF THE HARD WINTER WHEAT BELT*

By W. E. GRIMES

THE acreage devoted to wheat production in the United States at the close of the World War surpassed all previous figures for this crop. Under war-time influences the acreage reached the record figure of more than 75 million acres harvested in 1919. During the deflation period following 1920 the wheat acreage decreased and has been less than 60 million acres each year since 1922.

The reduction in wheat acreage was the combined response of all wheat growers to lower prices. Wheat prices had increased under war-time demand until in 1917 the purchasing power of wheat was 126% and in 1918 and 1919, 123% of prewar. From this advantageous point prices declined to a low point of 65% of prewar in 1923 (Table I). During the War the purchasing power of wheat advanced earlier and to a greater extent than the purchasing power of all farm products but following the War wheat did not reach its low point until in 1923 or two years later than the low point of purchasing power for all farm products. The lower purchasing power of wheat probably was an important factor contributing to the further decline in wheat acreage in 1924 and 1925, although abandonment of more than 1/5 of the winter wheat acreage was important in the later year.

In general the trend of wheat production was upward to a peak in 1919, then down to the low point in 1924 and 1925, with some increase in acreage in the last three years. The part played by various wheat producing sections of the United States in this general trend of wheat production varied. The hard winter wheat belt[1], particularly its western portion, responded rather differently than some of the other wheat growing regions of the United States and it is of particular interest to note the extent of the variations, some of their causes and the general trend of the agriculture of this region during this transition period.

Effects of Relative Prices

The varying response of wheat growers in different regions, or even in the same region, to the conditions existing since 1920 cannot be accounted for solely on the basis of the lower purchasing power of wheat. For one thing, all wheat is not alike, and prices of different kinds, and of the same grade of a particular kind of wheat, may and often do change relative to the prices of other kinds or grades of wheat. Such changes have occurred since 1920. High protein hard winter wheat has been in greater demand because of the commercial baker's increased need for high protein flour. The premiums paid for hard winter wheat of high protein content have been of greater importance since 1920 than in earlier years. As a consequence, high protein wheat of good milling quality has been relatively higher in price than some other kinds of wheat. If purchasing power figures for the different kinds

*Editorial note: This article has been prepared to parallel the article by J. E. Lattimer on "Recent Changes in Farm Organization in Western Canada," which appeared in the August issue of the *Journal*. The two articles afford a comparison of how the two regions have reacted to the recent developments in agriculture.

[1] The hard winter wheat belt includes portions of the states of Nebraska, Kansas, Colorado, Oklahoma and Texas.

and grades of wheat were available, it is probable that such figures for hard winter wheat would not show the decline that is shown in the purchasing power of all wheat. Another factor that has probably helped the price of wheat grown in the hard winter wheat belt has been the growth of the milling industry of the southwest. This has given a near-at-hand market for more of the wheat of the region.

The low prices of beef cattle also were a contributing factor. The purchasing power of cattle was less than 70% of prewar every year from 1920 to 1924 and was only 73% of prewar in 1925. This tended to discourage the use of prairie pasture land for cattle production and tended to encourage the movement already under way to break up prairie sod and devote it to the production of wheat and other crops that were relatively somewhat higher in price.

Effects of Improvements[2]

Improvements in production methods have had an important part in causing variations in the farmer's response to changing conditions. Such changes do not always affect the conditions of production of all producers in the same way. An improvement, such as a better type of farm tractor, may be of no advantage to the farmer who has small fields or whose farm is hilly and poorly adapted to the use of a tractor. However, such an improvement may be of great advantage to the farmer with large, level fields where tractors can be used advantageously.

Other illustrations of the unequal application of improved methods and practices to wheat production in different parts of the country include better methods of seed bed preparation in subhumid regions, new strains of wheat that are better adapted to regions of limited rainfall, and better adapted tillage and harvesting machinery. These improvements in wheat production have meant much to the farmer of the hard winter wheat belt but they have benefited the soft wheat grower of the eastern half of the United States but little and in some instances they may have been detrimental to his immediate interests by giving some of his wheat-growing competitors increased advantages.

Changes in Cropped Acreages

The Census of 1920 gives data on crop acreages in 1919. This was the peak year of United States wheat acreage. The Agricultural Census of 1925 gives the data for 1924 which was near the postwar low point in wheat acreage. Four

TABLE I. RELATIVE PURCHASING POWER OF WHEAT AND OF ALL FARM PRODUCTS. AUGUST, 1909—JULY, 1914 = 100

Year	Relative Purchasing Power of Wheat*	Relative Purchasing Power of Farmers' Products†	Wheat Acreage Harvested (Thousands of Acres)‡
1910	108	101	45,681
1911	102	99	49,543
1912	101	99	45,814
1913	86	95	50,184
1914	101	105	53,541
1915	126	99	60,469
1916	97	85	52,316
1917	126	97	45,089
1918	123	107	59,181
1919	123	105	75,694
1920	104	85	61,143
1921	79	69	63,696
1922	70	74	62,317
1923	65	79	59,659
1924	77	83	52,535
1925	103	89	52,255
1926	95	85	56,337
1927	90	86	58,583

* *Index Numbers of Farm Prices*, June, 1927, Bureau of Agricultural Economics, United States Department of Agriculture. (1927 figure computed from monthly figures published by the Bureau.)

† *The Agricultural Situation*, February, 1928, Vol. 12, No. 2, page 9. Bureau of Agricultural Economics, United States Department of Agriculture.

‡ *Yearbook of Agriculture*, 1927, page 739. United States Department of Agriculture.

[2] For a more complete discussion of this subject see Richard T. Ely, *et al.*, *Outlines of Land Economics*, Vol. II, "Cost and Income in Land Utilization" (Ann Arbor: Edwards Bros., 1922), pages 159–163.

wheat harvests have been completed in the hard winter wheat belt since 1924. Consequently, while the census figures give some indication of the changes under way, other more recent data are desirable to determine their trend up to the present. Complete data for the entire hard winter wheat belt are not available for the years since 1924 but data for a good portion of the area are available. This information combined with census data gives some indication of the changes under way.

Each of the states, in the hard winter wheat region, excepting Colorado, had a larger number of farms in 1925 than in 1920 although the change was not great. However, when changes by size groups are studied it is found that the number of small farms (9 acres or less) increased materially, farms of 10 to 99 acres also increased in number, farms of 1000 acres and more decreased in number, the groups between 100 and 499 acres show no pronounced tendency to change in number, while there was an increase in the number of farms of 500 to 999 acres. Although it is inadvisable to attach much significance to these changes without knowing more of the types of farming involved than census data reveal, it seems probable that the period from 1920 to 1925 marked an increase in the number of farms that in reality were suburban homes and that a number of ranches were being broken up into general farms. Data on crop production tend to substantiate the statement concerning the breaking up of ranches. Also, there seems to be a tendency to enlarge the area of the general farm.

Table II gives the total cultivated acreage of Nebraska, Kansas and Colorado for the years 1921 to 1927, inclusive. Texas and Oklahoma were not included since the larger parts of these states are outside the hard winter wheat belt. The acreages for the three states show a steady increase in cultivated land. This is contrary to what would be expected if the low prices of farm products were the only factor influencing farm production. However, under the influence of other factors and in spite of low prices the farmers of these three states increased their acreages of crops during these years.

TABLE II. TOTAL CULTIVATED ACREAGE OF NEBRASKA, KANSAS AND COLORADO, 1921 TO 1927, INCLUSIVE

Year	Nebraska* (Acres)	Kansas† (Acres)	Colorado‡ (Acres)
1921	16,407,050	22,104,523	5,822,741
1922	16,435,591	22,258,727	5,771,660
1923	16,385,921	22,264,310	6,289,143
1924	16,289,817	22,681,302	6,251,200
1925	17,102,547	22,280,990	6,141,500
1926	17,547,828	22,401,379	7,447,140
1927	17,902,447	22,784,538	7,596,570

* Data from *Nebraska Agricultural Statistics*, 1927, pages 16–17. Issued cooperatively by United States Department of Agriculture and Nebraska Department of Agriculture.
† Data from report of Kansas State Board of Agriculture.
‡ Data from *Yearbook* of United States Department of Agriculture and Agricultural Statistics of the state of Colorado issued by the State Board of Immigration.

In western Kansas, northwestern Oklahoma and Texas, eastern Colorado and southwestern Nebraska much prairie sod was broken during these years and planted to crops. This was a continuation of the movement under way prior to 1920 which was discussed by the late Secretary Wallace in his report to the President on the wheat situation in 1923.[3]

The movement from 1919 to 1924 to increase the cropped acreage of the hard winter wheat belt is described as follows by Dr. O. E. Baker in comparing land utilization as indicated by the 1920 and 1925 Censuses. "The largest area of increase in crop acreage shown . . . is the semi-arid, western portion of the Great Plains region, extending from the Staked Plains of northwestern Texas to

[3] "The Wheat Situation," a report to the President by Henry C. Wallace, Secretary of Agriculture (1923), pp. 53–56.

Montana and beyond. In this region wheat is the dominant crop in the entire area north of Texas, winter wheat in western Kansas and eastern Colorado, spring wheat in the western portion of the Dakotas and most of Montana. In most of the spring wheat portion of this region, however, the increase is more nominal than real. This region experienced in 1919 the most severe drought it has ever known, the acreage of wheat harvested in 1919 in Montana being less than half that planted . . . The central and southern Great Plains region experienced no unusual drought in 1919 and the increase in crop acreage shown in this region is real and probably permanent. In western Kansas and eastern Colorado the increase represents not only the expansion of winter wheat production, as already noted, but also an increase in the acreage of the sorghums (kafir, milo, etc.)"[4]

The trend of the wheat acreage in Kansas further illustrates the expansion of the cropped area (Table III). In western Kansas the wheat acreage seeded has steadily increased until the area seeded for the 1928 crop was nearly double the average area seeded during the war years. Central Kansas has expanded her wheat acreage but to a lesser extent than western Kansas. Eastern Kansas reduced the wheat acreage from the war-time peak of production.

The increase in the area devoted to wheat production in western Kansas may have been partially the result of a reduction in the area of other crops but this cannot account for nearly all of the increased acreage, since the area seeded to wheat for the crop of 1928 was considerably greater than the total area in cultivation within the region at the close of the World War.

TABLE III. AREA SEEDED TO WHEAT IN KANSAS FOR THE CROPS HARVESTED IN THE YEARS GIVEN*

Years	Eastern One-third of Kansas (Acres)	Central One-third of Kansas (Acres)	Western One-third of Kansas (Acres)
1917–19 average..	1,684,978	5,975,251	2,704,958
1921–23 average..	1,912,953	6,477,913	3,351,398
1925 crop.....	912,000	6,150,000	3,442,000
1928 crop.....	1,205,000	7,176,000	4,660,000

* Data from reports of Kansas State Board of Agriculture and Agricultural Statistician for Kansas.

Data for the other states in the hard winter wheat belt show the same tendency to increase the acreage of crops, particularly wheat. The greatest increase has occurred in the western portion of the region where prairie sod has been broken and become cropped land.

Improvements in Production

These increases in the cropped area occurred in spite of price relations that should have been discouraging. It is necessary, therefore, to look for factors, other than price, that aided in bringing about this movement to expand farming when most other regions were reducing production. Improved machinery and improved production methods undoubtedly have been important in causing these changes. Better adapted varieties of crops, improved tillage machinery, the development of the farm tractors, the increased use of the truck and the automobile for farm business purposes, the introduction of the combined harvester-thresher, and better knowledge of the best methods of crop production in the hard winter wheat belt are important among the factors causing the change.

New varieties of wheat, oats, and other crops have been introduced in recent years. These varieties are better adapted to conditions and have been giving consistently higher yields than

[4] O. E. Baker. "Changes in the Utilization of Land in the United States, 1919–1924," a preliminary report. Bureau of Agricultural Economics, United States Department of Agriculture (June, 1926), p. 26.

those previously grown. These new varieties, particularly of wheat, are now the ones most commonly grown. By using them it has been possible to extend the wheat belt westward to lands that formerly were sub-marginal for wheat production.

The increased use of power machinery, such as tractors, trucks, automobiles, and combined harvester-threshers, is shown for Nebraska and Kansas in Tables IV and V. In 1915, Kansas had less than 2500 farm tractors. By 1927 the number had increased to 38,061. On March 1, 1920, the number of tractors in Kansas was 14,370, so the number has considerably more than doubled during the postwar period. The combined harvester-thresher was first used in Kansas in 1917 and 1918. In 1927 and 1928 fully half or more of the wheat of the state was harvested with combines. The number of combines on Kansas farms on March 1, 1927, was 7,563. During 1927 and 1928 Kansas farmers purchased fully as many more until it has been estimated that there were 15,000 to 17,000 combines in use in the 1928 Kansas wheat harvest.

TABLE IV. POWER MACHINERY AND EQUIPMENT ON NEBRASKA FARMS, 1925–27*

	1925	1926	1927
Automobiles	102,164	112,878	116,808
Trucks	8,468	12,037	13,563
Gas tractors	13,733	19,489	19,703
Combined harvester-threshers	.....	.....	1,602

* *Nebraska Agricultural Statistics*, 1925, p. 21; 1926, p. 29; 1927, p. 37. Issued cooperatively by the United States Department of Agriculture and Nebraska Department of Agriculture.

Less complete data for other states of the hard winter wheat belt indicated that these trends in the use of power machinery are typical of the entire region.

Effect on Costs of Production

The introduction of better yielding varieties of crops and the increased use of power machinery, particularly the combined harvester-thresher, have resulted in lower costs of producing wheat. The higher yields secured with the newer varieties involve little additional cost per acre so the result is a lowering of bushel costs. These costs have been further lowered by the use of the combined harvester-thresher for harvesting. This machine does the harvesting for approximately half the cost involved when headers or binders and stationary threshers are used.

These lower costs of production are the most important answer to the question of why the hard winter wheat belt has been expanding production and has been extended westward during a period of depression. Wheat production under the newer methods has been profitable even at low prices for wheat.

The increased use of power machinery has made larger farms desirable because on them tractors, combines and other equipment can be used to near capacity.

TABLE V. POWER MACHINERY AND EQUIPMENT ON KANSAS FARMS, MARCH 1, 1922 AND 1927*

	March 1, 1922	March 1, 1927
Automobiles	114,719	143,415
Trucks	5,402	14,546
Tractors	21,715	38,061
Electric motors	1,463	2,172
Combined harvester-threshers	.....	7,562

* *Report* of the Kansas State Board of Agriculture for the quarter ending December, 1927, p. 74.

Data available from assessors' rolls for typical Kansas townships show that since 1924 the size of the typical farm in parts of southwestern Kansas has been doubled. This has been the farmers' response to changed conditions of wheat production that have made a larger farm area desirable.

Wheat Marketing Problems

The combined harvester-thresher cuts and threshes the grain in one operation

so the wheat can go, and much of it does go, directly from the field to the local elevator and from there to terminal markets. In wet harvests such as 1928, or when yields are particularly heavy, the movement of wheat to market during July is heavy. It taxes local and terminal storage and handling facilities and also rail transportation facilities to the utmost. Table VI gives Kansas City receipts of wheat for July and August both before and since the combine came into common use. The heavy receipts in July in years of large crops, such as 1926 and 1928, are typical results of the use of the combine.

TABLE VI. CARLOT RECEIPTS OF WHEAT AT KANSAS CITY IN JULY AND AUGUST, 1919–1928*

Year	July Receipts (Cars)	August Receipts (Cars)
1928	24,868	.....
1927	13,956	12,659
1926	22,821	12,195
1925	7,959	6,346
1924	14,615	17,553
1923	6,673	9,121
1922	8,424	8,619
1921	14,210	12,386
1920	5,015	6,320
1919	10,253	14,012

*Data from reports of the *Kansas City Grain Market Review.*

In addition to a heavy early movement of wheat to market, the use of the combine has resulted in more wet wheat being marketed. This wheat will go out of condition in storage unless dried before storing. This increases marketing costs and hazards. The result of this heavy early movement of wheat has been lower prices at the peak of the movement, and in some years, considerable quantities of low grade wheat. One of the possible ways of solving this problem is through increased farm storage facilities and holding the wheat on the farm until after harvest, when it can be marketed in a more orderly manner with less risk and the possibility of better prices. Any solution of this problem that results in better prices for wheat will encourage the continuation of the present trends in the agriculture of the region.

Land Values

Land values within the region have responded to these changed conditions. The effects of the depression were reflected to a less degree in the prices of land sold within the hard winter wheat belt as compared to the trend of land values throughout the United States. Table VII gives data on sales of land as reported for Kansas, and Nebraska and for the United States as reported by the United States Department of Agriculture. Sale prices in these states show less decline than in the United States as a whole and values of land in the western portion of the hard winter wheat belt as illustrated by the western Kansas data started upward in 1924.

Sales of farm land were quite numerous in southwest Kansas and adjoining regions in 1927 and particularly in 1928. These sales seem to be the result of the struggle for larger farm units, since most of them are reported to be sales to farmers who are buying land adjacent to that which they own, thereby insuring con-

TABLE VII. FARM REAL ESTATE VALUES IN NEBRASKA, KANSAS AND THE UNITED STATES
(Prices per acre)

Year	Nebraska*	Kansas†	Western Kansas†	United States‡
1920	.....	$60.46	$29.07	$107.89
1921	.....	57.83	28.14	99.33
1922	$61.61	52.07	25.41	85.26
1923	58.79	49.62	25.79	82.25
1924	57.00	46.65	27.19	78.82
1925	62.00	47.52	27.66	77.83
1926	57.08	48.00	28.80	76.47
1927	59.25	48.10	27.48	.....

* *Nebraska Agricultural Statistics*, 1927, pp. 26–31. Issued cooperatively by United States Department of Agriculture and Nebraska Department of Agriculture.
† Data from reports of actual sales to Kansas Public Service Commission.
‡ E. H. Wiecking, "The Farm Real Estate Situation, 1926." *Department Circular 377*, United States Department of Agriculture, p. 6.

trol of sufficient acreage to permit efficient use of the larger types of farm machinery.

Population Changes

Two opposing forces are affecting the rural population in the hard winter wheat belt. The westward extension of the wheat belt tends to increase the rural population and data available from reports of the Kansas State Board of Agriculture show material increases in the number of people outside of incorporated places in western Kansas since 1915 but since 1925 the number has been fairly constant. In central Kansas the number of people living outside of incorporated places has been declining since 1915. This illustrates the second force affecting the farm population which is the tendency toward larger and fewer farms with a smaller total farm population. If the trend continues in the direction it appears to have taken in recent years, fewer and larger farms and a smaller farm population will be found in the hard winter wheat belt.

TABLE VIII. MODERN FARM CONVENIENCES IN NEBRASKA, 1925, 1926 AND 1927*

Convenience	Number of Farm Homes Having These Conveniences in		
	1925	1926	1927
Modern heating systems	9,262	11,564	13,634
Modern light systems	10,584	13,731	15,881
Modern water systems	12,482	16,422	19,138
Baths	7,629	10,340	12,783
Radios	12,682	21,658	32,627

* *Nebraska Agricultural Statistics*, 1925, p. 18; 1926, p. 26, and 1927, p. 35, issued cooperatively by United States Department of Agriculture and Nebraska Department of Agriculture.

Farm Home Conveniences

A period of depression such as has affected agriculture since 1920 is not usually considered a time when farmers are improving their living conditions and yet that is what Kansas and Nebraska farmers were doing during these years. The number of modern farm homes in Kansas almost doubled from 1922 to 1927 and Nebraska farmers materially increased their modern conveniences from 1925 to 1927. The trend in this regard is shown in Tables VIII and IX. Low prices for farm products did not prevent many farmers from improving their living conditions. The rapid introduction of the radio is of particular interest, nearly half the farm homes of Kansas and more than a fourth of the farm homes of Nebraska having radios in 1927.

These changes occurred in spite of prices for farm products that were discouraging. It is not to be assumed that these changes were accomplished without hardship or that the hard winter wheat belt did not feel the effects of the postwar depression. Those farmers who found themselves unable to shift to the newer production methods and machinery found the period doubly trying. Many were forced out and their farms have gone to enlarge the farms of those remaining. The farmer with a heavy debt contracted in times of high prices found it difficult or impossible to pay out. Instances of foreclosure and of financial failure have been common among the farmers of the region. This is

TABLE IX. MODERN FARM CONVENIENCES IN KANSAS, 1922 AND 1927*

Convenience	Number of Farm Homes Having Conveniences in	
	1922	1927
Lighting system	8,282	11,784
Running water system:		
In kitchen sink	5,797	9,450
In bathroom	3,605	5,799
Home heating system	4,132	5,787
Radio	.....	77,013

* *Report* of the Kansas State Board of Agriculture for the quarter ending December, 1927, p. 74.

another phase of the postwar conditions with which no attempt has been made to deal in this discussion.

The farmers of the hard winter wheat belt, when taken as a group, have met the postwar depression by increasing their crop acreage, expanding wheat production, enlarging their farms and using improved machinery and production methods that have lowered their costs of production and permitted many of them to operate profitably.

INTEGRATION OF PUBLIC AND PRIVATE ELECTRIC PLANTS IN WISCONSIN

By E. O. MALOTT

STUDIES have been made of the changing character of municipal ownership in a number of states[1] and as a continuation of this line of endeavor a similar study has been made of private ownership in Wisconsin. As a preliminary to the state study reference will be made to the federal census of central stations in order first to note the movement towards integration for the country as a whole and second to bring out relations between types of ownership not available in the state data.

Experience of Public Ownership Revealed by the Census Data

According to the 1922 census of central stations, the number of commercial electric light and power establishments[2] decreased 10.7% in the five-year period from 1917 to 1922, although there had been a steady increase from 1902 to 1917 (Table I). That this decrease does not indicate the withdrawal of service is shown by the fact that from 1917 to 1922 the value of plant and equipment increased 44.2% and the kilowatt-hours generated increased 57.4% and kilowatt-hours purchased increased 74.0%. The number of customers increased 78.4%.

On the other hand, municipal plants have had a continued growth in their number, as well as in their investment and revenues. But since 1912 expenses of municipally owned plants have been increasing more rapidly than have revenues. The rate of increase in kilowatt-hours generated fell, in the period 1917–1922, below both of the preceding five-year periods. Moreover, the rate of increase of power purchased, in the later period, was considerably more than twice as great as the rate of increase of power generated (Table I).

The assumption that the power purchased was generated by a commercial establishment is believed to be reasonable since very few power exchanges between municipal plants are known. Accepting this assumption, it follows that municipal distributing systems feel an increasing dependence upon commercial plants. Since the rate of increase of expenses is more rapid than the corresponding rate of increase of revenues, the conclusion may be drawn that municipal plants are finding it financially advantageous to sell out to the commercial plants which are at present interconnected with them.

Another conclusion from the census statistics is that municipally owned establishments are, in general, small plants. Although municipal plants serve one-third of all the communities supplied with electricity, 84.5% of the municipal plants are in towns of less than 5,000 population (Tables II and III). Moreover, in the larger cities the census notes

[1] See Herbert B. Dorau, "The Rise and Decline of Municipal Ownership in the Electric Light and Power Industry of Wisconsin" (May, 1927), and "Municipal Ownership in the Electric Light and Power Industry of Massachusetts" (August, 1927); Hubert F. Havlik, "The Changing Character and Extent of Municipal Ownership in the Electric Light and Power Industry of Missouri" (May, 1928); Helen E. Heggie, "Developments in Municipal Ownership of Electric Plants in Minnesota" (August, 1928), all in the *Journal of Land & Public Utility Economics*.

[2] As used in the census the term "establishment" usually denotes plant and equipment under single ownership although, when possible, separate reports might be accepted for individual plants of a system.

TABLE I. RATE OF CHANGE IN MUNICIPAL AND PRIVATE ESTABLISHMENTS, BY FIVE-YEAR PERIODS: 1902–1922*

Period	Number of Establishments	Value of Plant and Equipment	Total Revenues	Total Expenses	Output		Number of Customers
					Generated	Purchased	
Municipal							
1917–1922.....	11.3%	85.0%	112.2%	113.5%	80.7%	192.3%	68.4%
1912–1917.....	48.4	65.3	73.4	85.8	93.4	117.4	85.8
1907–1912.....	24.8	79.7	65.7	64.0	85.7	†	85.3
1902–1907.....	53.6	94.7	101.2	96.7	47.8	†	†
Private							
1917–1922.....	—10.7	44.2	102.8	100.6	57.4	74.0	78.4
1912–1917.....	15.4	39.8	74.4	81.5	121.2	114.4	87.3
1907–1912.....	5.7	99.1	72.6	124.1	98.0	†	99.1
1902–1907.....	23.4	118.4	105.3	91.3	141.1	†	†

* Adapted from Tables 5 and 6, Census Report, *Central Electric Light and Power Stations, 1922.*
† Not reported.

that street lighting is the main function of the municipal plant so that the size of equipment would be smaller than usual for a similar population group where the equipment carried the full load of the community.

In the 1902 census, private establishments were grouped according to population size. But in 1907 this practice was discontinued because of difficulty in ascertaining the population of the area served by a private company which was assigned to the place in which the plant itself was located. "In many instances large plants are now located at places where water power is available for the generation of the current but at great distances from the places where the current is used."[3] "Some electric companies, though owning two or more central stations situated in widely separated places, made but one report covering all of their properties. As a rule, such reports are assigned to the place in which the principal plant is located."[4] "While, therefore, this grouping of the stations in 1902 by population may have been instructive to some extent, the defects are too great, so far as relates to commercial stations, to warrant such an analysis at the census of 1907."[5]

In spite of the fact that the grouping of private establishments according to population in the 1902 census tends to *understate* the population served, the data are presented in Table IV. While 72.8% of private plants are in places of less than 5,000, this percentage would probably be decreased if an accurate statement of population served could have been obtained. On the other hand, municipal plants have, in general, been limited in their activity to the political confines of the municipality. Accordingly classifications of municipal plants on the basis of population are representative and have been continued by the Bureau of the Census.

TABLE II. NUMBER OF ESTABLISHMENTS, BY TYPES OF OWNERSHIP: 1902–1922*

Census Year	Municipal	Private			
		Total	Individual	Firm	Incorporated
1922	2,581	3,774	707	314	2,753
1917	2,318	4,224	909	397	2,918
1912	1,562	3,659	587	293	2,779
1907	1,252	3,462	609	298	2,555
1902	815	2,805	528	228	2,049

* Assembled from Census Reports, *Central Electric Light and Power Stations.*

[3] Census Report, *Central Electric Light and Power Stations, 1907*, p. 22.
[4] *Idem*, page 23.
[5] *Idem*, page 23.

Technological Limitations of Small Electric Plants

The key to the status of the small plant is the technology of the electric power industry. Units of electrical generating equipment, as is characteristic of most industrial equipment, increase in physical efficiency with an increase of size. Whereas the first turbo-generators of 1903 were rated at 5,000 kilowatts, to-day a single unit of over 200,000 kilowatts is under construction for a generating company. Steam engines have largely been eliminated by the more economical turbine which is capable of greater capacity per unit of equipment. Improvements in transmission practice and equipment have made possible the economical distribution, over large areas, of electricity from centralized, generating stations. As in the case of most enterprises based on principles of mass production, a small fractional increase of efficiency with a large unit of equipment represents an appreciable saving.

Table III. Number and Per Cent. Distribution of Municipal Establishments, by Population Groups: 1902–1922*

Population Group	Census Year	Number of Establishments	Per Cent. Distribution
Under 5,000	1922	2,182	84.5
	1917	1,940	83.7
	1912	1,327	84.9
	1907	1,081	86.3
	1902	671	82.4
5,000 to 25,000	1922	340	13.2
	1917	322	13.9
	1912	189	12.2
	1907	142	11.3
	1902	121	14.8
25,000 to 100,000	1922	43	1.7
	1917	39	1.7
	1912	31	2.0
	1907	17	1.4
	1902	13	1.6
100,000 to 500,000	1922	8	0.3
	1917	9	0.3
	1912	7	0.4
	1907	6	0.5
	1902	6	0.7
500,000 and over	1922	8	0.3
	1917	8	0.3
	1912	8	0.5
	1907	6	0.5
	1902	4	0.5

* Assembled from Census Reports, *Central Electric Light and Power Stations.*

Although the same rule of efficiency applies in somewhat lesser degree to hydro equipment, its effect is not felt so quickly if a head of water exists in excess of present needs. Oil engines are limited in their application, even with the economical Diesel type, to small plants and for stand-by service. Usually the small independent plants are so handicapped by lack of capital that the installation of an oil engine, although it may become inefficient, is fixed for several years at least. Small plants as self-sufficient stations whether municipal or private are thus shut off from the economies of size and mass production.

Returning now to the municipal establishments, if a population of 25,000 is taken as necessary for the support of moderately large-scale equipment, only 2.3% of all municipal plants are within this limit (Table III). For most municipal plants an economic situation exists which sooner or later forces them to give up their self-sufficiency as generating stations if not their existence as municipal plants. The alternative is, of course,

Table IV. Number of Private Establishments Grouped in Cities of Different Populations, and the Percent. Distribution in Each Group: 1902*

Population of Cities in Which Located	Number	Percent. Distribution
Less than 5,000	2,044	72.8%
5,000 to 25,000	554	19.8
25,000 to 100,000	115	4.1
100,000 to 500,000	66	2.4
500,000 and over	26	0.9

* Census Report, *Central Electric Light and Power Stations 1902*, table 6, p. 9.

the generation of electricity at a cost considerably above that of electricity being distributed by neighboring and competitive communities served from the more efficient, large-scale stations of an integrated system.

TABLE V. RELATIVE IMPORTANCE OF DIFFERENT TYPES OF OWNERSHIP OF CENTRAL ELECTRIC ESTABLISHMENTS: 1922*

	Average per Private Establishment			Average per Municipal Establishment
	Individual	Firm	Incorporated	
Revenues (Dollars)....	6,732	8,221	355,737	33,102
H. P. of Prime Movers.	71	92	2,319	704
K. W. Capacity of Generators.....	54	72	1,716	499
K. W. Hours Generated	81,176	144,127	13,915,943	1,033,166
Number of Customers .	145	172	3,962	637

* Census Report, *Central Electric Light and Power Stations, 1922*, table on p. 6 and table 11, p. 13.

The output of plants in places of less than 25,000 inhabitants was only 41.6% of the total kilowatt-hours generated by municipally owned establishments. But over 58% of the total kilowatt-hours purchased by municipal plants was bought by this group.[6] Probably the reason the latter percentage is not larger is that a large proportion of municipal plants are located in areas not served at present by the interconnected network of private systems.

Municipal plants have not interconnected to a large efficient power plant jointly owned by the municipalities because there are probably only a few districts which have a sufficient number of municipal plants situated close together and with a connected load large enough to justify the common, large, efficient station. In addition, present legal limitations restrict the possibility for cooperative action, and "local patriotism" and jealousy also constitute hindrances. Therefore, in contrast, a decrease in the number of municipal plants nearly always means a decrease of municipal participation in the electric utility business, while a decrease in the number of private plants usually does not affect private participation in the business because the private plant is merely integrated into a system.

Experience of Small Private Plants as Shown by Census Data

Turning now to the smaller private plants an assumption is made to gain an indication of their careers. The assumption is that the plants listed by the census as owned by individuals and by firms are small plants and that the corporations represent the large private plants. Some risk may be taken in making this assumption because undoubtedly some corporations operate small plants and some firms or individuals may own large plants. When reference is made to average generator capacity, average number of customers, etc., of the three types of ownership (Table V),

[6] See Census Report, *Central Electric Light and Power Stations, 1922*, summary table at the bottom of page 7.

TABLE VI. RATE OF CHANGE IN PRIVATE ESTABLISHMENTS, BY FIVE-YEAR PERIODS: 1902–1922*

Period	Number of Establishments			Individual		Firm		Incorporated	
	Individual	Firm	Incorporated	Total Revenue	Total Expenses	Total Revenue	Total Expenses	Total Revenue	Total Expenses
1917–1922.....	—22.2%	—20.9%	— 5.7%	39.3%	45.7%	43.0%	53.8%	103.4%	101.1%
1912–1917.....	54.8	35.5	5.0	16.6	24.9	14.6	24.0	75.3	82.4
1907–1912.....	— 3.6	— 1.7	8.8	23.6	33.4	6.6	8.5	73.9	126.9
1902–1907.....	15.3	30.7	24.7	†	†	†	†	†	†

* Assembled from Census Reports, *Central Electric Light and Power Stations.*
† Not reported separately.

the assumption which has been made seems valid. From this table, establishments may be ranked in relative importance as follows: incorporated plants, municipal plants, plants owned by firms, and plants owned by individuals.

A glance at Table VI will show that the small private plants owned by individuals and by firms have had about the same experience as the municipal plants. Total expenses are increasing more rapidly than total revenues and, moreover, the spread between the increase for expenses and the increase for revenues is much greater for private plants than for public plants. Even for corporations during this period, 1917 to 1922, the difference between the rate of increase of total revenues and of total expenses is slight but sufficient (2.3%). This average 2.3% differential in favor of increased revenues indicates that the corporations on the whole are becoming more profitable although some may have managed only to keep going while others have a considerable increase in profitableness.[7]

Conclusion from National Experience

A conclusion from national experience as indicated by the census data is that small establishments are being integrated into larger establishments. This movement from smaller to larger establishments *is not peculiar to a particular type of ownership;* rather is it a characteristic of small plants regardless of ownership and is the result of technological advance.[8] The extent of the movement is better appreciated when the number of plants under each type of ownership at any time (Table II) is understood as the *net* result of all substractions due to integration or withdrawal from business and of all additions due to new establishments being started. For example, the 2,581 municipal plants in 1922 represent the net result of the deductions from the 2,318 plants in 1917 of plants sold or "abandoned" by municipalities, and the additions made by the acquisition through purchase or construction of public plants in other municipalities.

Technique of a Study of Wisconsin Experience

This conclusion or hypothesis based on census data seems substantiated by the study of the integration of electric light and power establishments in Wisconsin, continuing the investigation of municipal ownership in that state. In the study of integration the difficulty of separating types of private ownership suggested the use of census material to bring out the fact that all types of ownership are involved in integration. The search for available information about the private and public utilities of Wisconsin has gone further. Establishments were first classified according to

[7] Attention is called to the fact that the above comparisons are between *total* expenses and revenues. Discussion of the trend of expenses and revenues *per unit* would lead too far afield.

[8] Such a conclusion would be evident from the material available in the Census Reports of *Central Electric Light and Power Stations*. For instance, the 1917 report contains a table (Table 96, p. 129–132) presenting the comparative cost statistics of selected generating stations grouped according to output generated and type of primary power used. As long ago as the 1907 report the following statement (page 96) was made: "Indeed, the notable tendency toward the consolidation of small individual stations into large 'systems' with extensive networks has brought with it the wholesale 'scrapping' of plants and apparatus and the installation of generating and consuming appliances of far higher efficiency and economy, in order to meet the demand on the part of the public for cheaper and better service." This same conclusion was reached in an unpublished thesis of the writer which was submitted in June, 1926, to the faculty of Northwestern University. "Nor has integration been limited to any particular type of ownership organization as a decrease of all types from 1917 to 1922 is shown." (p. 24.) The last paragraph of an article by Herbert B. Dorau, "The Rise and Decline of Municipal Ownership in the Electric Light and Power Industry in Wisconsin," *supra*, n. 1, p. 181–2, suggests a similar conclusion.

whether they were generating all, part, or none, of their output and in addition a classification was made according to type of generating station.[9]

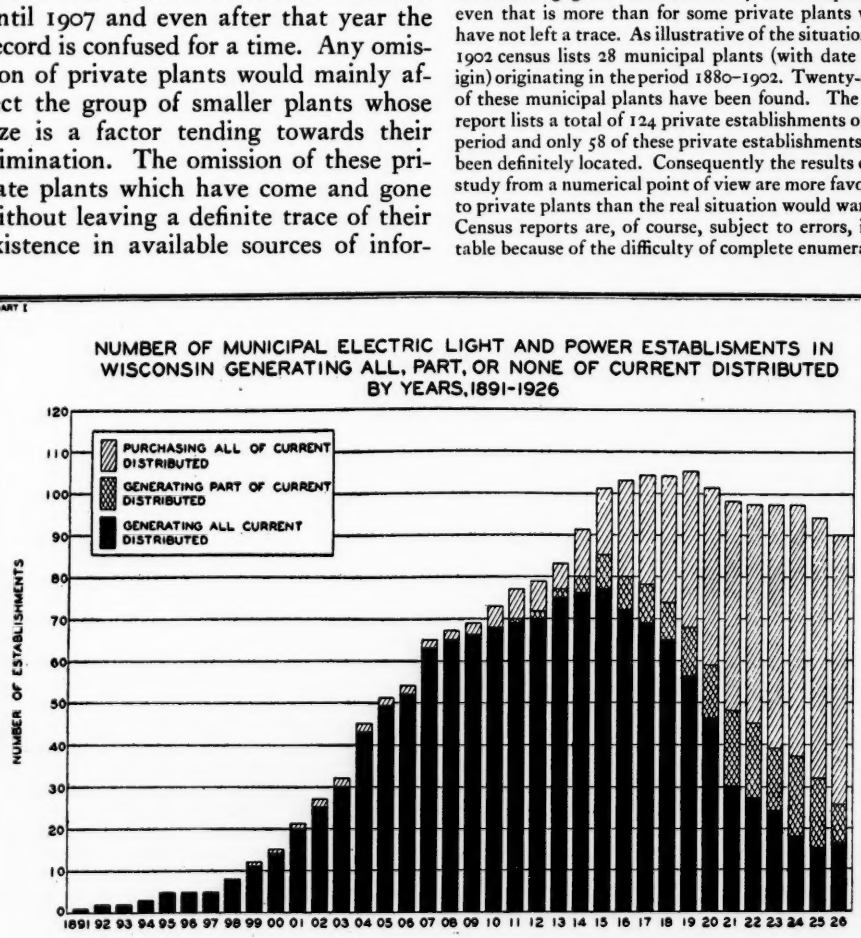
Before presenting results of the analysis, certain details of method should be explained. Reasonable care was exercised in making the list of private plants. The writer is well aware that the list is not complete because continuous records of private plants could not be found. The Railroad Commission of Wisconsin did not have control of electric utilities until 1907 and even after that year the record is confused for a time. Any omission of private plants would mainly affect the group of smaller plants whose size is a factor tending towards their elimination. The omission of these private plants which have come and gone without leaving a definite trace of their existence in available sources of information tends to make the results somewhat more favorable to private ownership than a complete and accurate count would show. The extent of civic interest in the municipal plants prevents any loss of record or oversight of identity in their case.[10]

[9] Acknowledgment is made to Miss Helen E. Heggie for her assistance in the classification of the material for the private plants.

[10] This does not mean that a municipal plant cannot be overlooked but only that the possibility of doing so is almost negligible. The record may be incomplete but even that is more than for some private plants which have not left a trace. As illustrative of the situation, the 1902 census lists 28 municipal plants (with date of origin) originating in the period 1880–1902. Twenty-seven of these municipal plants have been found. The same report lists a total of 124 private establishments of that period and only 58 of these private establishments have been definitely located. Consequently the results of the study from a numerical point of view are more favorable to private plants than the real situation would warrant. Census reports are, of course, subject to errors, inevitable because of the difficulty of complete enumeration.

CHART I

NUMBER OF MUNICIPAL ELECTRIC LIGHT AND POWER ESTABLISMENTS IN WISCONSIN GENERATING ALL, PART, OR NONE OF CURRENT DISTRIBUTED BY YEARS, 1891-1926



When a private plant was purchased by another private plant, the identity of the first plant was merged with that of the second even though the first plant was kept as a legal entity apart from the second. This seems the proper way to treat such a situation in as much as, from an operating and business point of view, such private plants are considered as a system. However, the legal fiction of the subsidiaries and their holding company is recognized by the Railroad Commission in that the subsidiaries may make individual reports which are then filed under the classification of the major company. For purposes of regulation, separation of accounts by districts, department, community, or other division, is necessary. From the holding company's standpoint, moreover, a subsidiary is retained as a separate corporate entity to preserve certain individual corporate rights. But from an economic standpoint the business, or physical, separation of the subsidiary from the major company would be similar to the removal of an active member of a living organism. The functioning of the organism would be impaired. In fact, the impaired functioning of the major company might, from a legal standpoint, be made the basis of a claim for severance damages.

Wisconsin Establishments by Source of Output

The similar experience of small private and municipal plants can be seen at a glance from the graphic portrayal of the statistical results of the study.

Chart I presents the experience of municipal plants in Wisconsin when classified according to source of output.[11] Chart II presents the experience of private plants in Wisconsin classified on the same basis. Table VII presents the data which were used in the preparation

[11] This chart was used by Herbert B. Dorau in the article previously referred to. It has, however, been revised in the light of more recent and complete information. As noted in that article, certain establishments were omitted and the same omissions are made here.

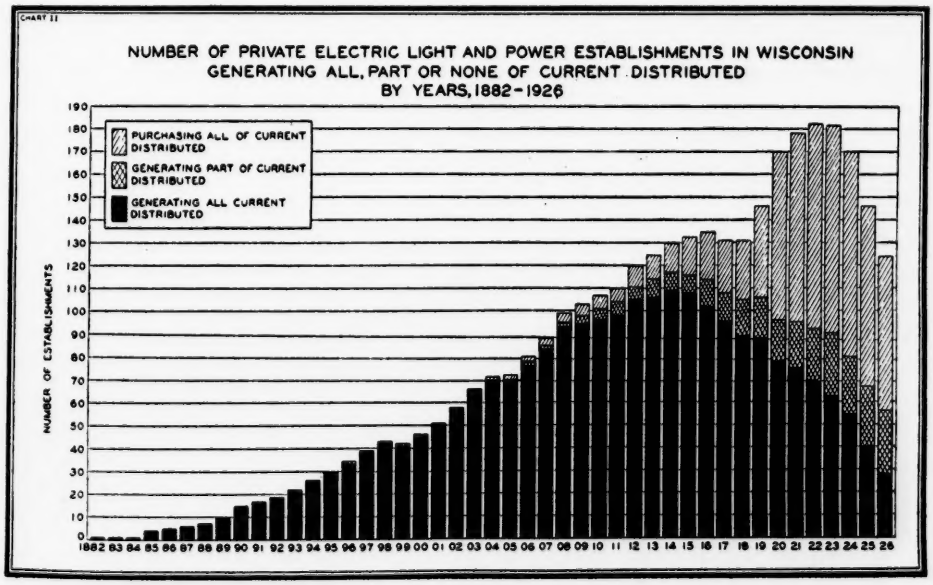


CHART II
NUMBER OF PRIVATE ELECTRIC LIGHT AND POWER ESTABLISHMENTS IN WISCONSIN GENERATING ALL, PART OR NONE OF CURRENT DISTRIBUTED BY YEARS, 1882-1926
PURCHASING ALL OF CURRENT DISTRIBUTED
GENERATING PART OF CURRENT DISTRIBUTED
GENERATING ALL CURRENT DISTRIBUTED
NUMBER OF ESTABLISHMENTS
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190
1882 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

of all the charts. These charts tend to emphasize numbers of plants and caution should be exercised in drawing inferences from numbers alone. The charts do show that, in general, the same phenomena are occurring among private plants as among public plants.

The number of private establishments generating all their output has decreased since 1914 just as did muncipal plants at about the same time. This decrease may be caused by changing to partly purchasing, to entirely purchasing, or to integration into a system. Integration of a private plant into a system does not increase the number of establishments in the class of the major company since in this study such a circumstance for either private or public plants is treated as it truly is—an absorption. On the other hand, it appears from the charts that the number of private establishments generating and purchasing and the number of those purchasing their entire output has increased.

However, the chart method does not readily lend itself to comparative analysis. Moreover, these economic phenomena seem best studied from a dynamic point of view. Therefore, because of the

TABLE VII. ANALYSIS OF EXTENT AND CHANGING CHARACTER OF OWNERSHIP OF ELECTRIC LIGHT AND POWER ESTABLISHMENTS IN WISCONSIN BY YEARS, 1882–1926

YEAR	TOTAL NUMBER IN EXISTENCE		TOTAL NUMBER IN EXISTENCE BY SOURCE OF SUPPLY						NUMBER CHANGING OWNERSHIP		TOTAL NUMBER BY TYPE OF STATION							
			Generating		Generating and Purchasing		Purchasing		Private to Municipal	Municipal to Private	Steam		Hydro		Gas and Oil		Purchasing	
	Municipal	Private	Municipal	Private	Municipal	Private	Municipal	Private			Municipal	Private	Municipal	Private	Municipal	Private	Municipal	Private
1882	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
1883	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
1884	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
1885	.....	4	.....	4	.....	.....	.....	.....	.....	.....	.....	1	.....	3	.....	.....	.....	.....
1886	.....	5	.....	5	.....	.....	.....	.....	.....	.....	.....	1	.....	4	.....	.....	.....	.....
1887	.....	6	.....	6	.....	.....	.....	.....	.....	.....	.....	2	.....	4	.....	.....	.....	.....
1888	.....	7	.....	7	.....	.....	.....	.....	.....	.....	.....	2	.....	5	.....	.....	.....	.....
1889	.....	10	.....	10	.....	.....	.....	.....	.....	.....	.....	5	.....	5	.....	.....	.....	.....
1890	.....	15	.....	15	.....	.....	.....	.....	.....	.....	.....	9	.....	6	.....	.....	.....	.....
1891	1	17	1	17	.....	.....	.....	.....	.....	.....	1	9	.....	8	.....	.....	.....	.....
1892	2	19	2	19	.....	.....	.....	.....	.....	.....	2	11	.....	8	.....	.....	.....	.....
1893	2	22	2	22	.....	.....	.....	.....	.....	.....	2	13	.....	9	.....	.....	.....	.....
1894	3	26	3	26	.....	.....	.....	.....	.....	.....	3	16	.....	10	.....	.....	.....	.....
1895	5	30	5	30	.....	.....	.....	.....	.....	.....	5	18	.....	12	.....	.....	.....	.....
1896	5	34	5	33	.....	1	.....	.....	.....	.....	5	22	.....	12	.....	.....	.....	.....
1897	5	39	5	38	.....	1	.....	.....	.....	.....	5	25	.....	14	.....	.....	.....	.....
1898	8	43	8	42	.....	1	.....	.....	.....	.....	7	29	1	14	.....	.....	.....	.....
1899	12	42	11	41	.....	1	1	.....	.....	.....	10	27	1	15	.....	.....	1	.....
1900	15	46	14	45	.....	1	1	.....	.....	.....	13	29	1	16	.....	1	1	.....
1901	21	51	20	50	.....	1	1	.....	1	.....	18	31	2	19	.....	1	1	.....
1902	27	58	25	57	.....	1	2	.....	.....	.....	23	33	2	24	.....	1	2	.....
1903	32	66	30	65	.....	1	2	.....	.....	.....	28	37	2	28	.....	1	2	.....
1904	45	71	43	69	.....	1	2	1	1	.....	40	38	3	31	.....	1	2	1
1905	51	72	49	69	.....	1	2	2	2	.....	44	39	5	30	.....	1	2	2
1906	54	80	52	76	.....	2	2	2	1	.....	44	43	7	34	1	1	2	2
1907	65	88	63	83	.....	2	2	3	2	.....	51	45	9	38	3	2	2	3
1908	67	99	65	93	.....	2	2	4	.....	.....	53	50	9	41	3	4	2	4
1909	69	103	66	94	.....	4	3	5	1	.....	54	51	9	43	3	4	3	5
1910	73	107	68	96	.....	5	5	6	2	.....	55	51	9	46	4	4	5	6
1911	77	110	69	98	1	6	7	6	1	.....	55	51	9	47	6	6	7	6
1912	79	120	70	105	2	6	7	9	1	.....	55	52	10	51	7	8	7	9
1913	83	125	75	106	2	8	6	11	2	.....	55	52	12	54	10	8	6	11
1914	91	130	76	109	4	8	11	13	2	.....	56	45	13	58	11	14	11	13
1915	101	133	77	108	8	8	16	17	2	.....	57	44	15	58	13	14	16	17
1916	103	135	72	102	8	12	23	21	.....	.....	52	42	15	55	13	17	23	21
1917	104	131	69	95	9	13	26	23	1	1	50	36	15	55	13	17	26	23
1918	104	131	65	89	9	16	30	26	1	2	45	32	16	56	13	17	30	26
1919	105	146	56	88	12	18	37	40	1	2	40	33	16	58	12	15	37	40
1920	101	170	46	78	13	18	42	74	1	6	36	29	13	57	10	10	42	74
1921	98	178	30	75	18	20	50	83	.....	3	27	27	13	59	8	9	50	83
1922	97	182	27	69	18	23	52	90	.....	1	25	25	13	55	7	12	52	90
1923	97	181	24	63	15	27	58	91	.....	2	22	24	13	54	4	12	58	91
1924	97	170	18	55	19	25	60	90	.....	1	21	19	13	50	3	11	60	90
1925	94	146	15	40	17	27	62	79	1	4	18	16	13	43	1	8	62	79
1926	90	124	16	28	9	28	65	68	.....	4	11	13	13	36	1	7	65	68

difference in numbers and their dynamic significance a better method of comparison is the rate of change of the number of private and public plants in each class. This method tends to eliminate the influence of mere aggregates in number. A quick method of making such a comparison is to plot the respective series with a logarithmic scale.[12] In reading curves plotted with a logarithmic scale for one coordinate, interest is centered in the slope of the curve which represents the rate of change of the series of data being examined.

All the series of classifications given in the Wisconsin municipal and private ownership charts (Charts I and II) are presented for rate-of-change comparison in Figures 1 to 4 (Chart III). In Figure 1, the rate of change of the total number of private and municipal establishments shows that the relative decrease in the number of municipal plants is less than that for the number of private plants. This does not mean that municipal plants are gaining ground or that private ownership is disappearing. More valid deductions are that private ownership is concentrating into larger companies and that municipal establishments display a certain reluctance or inertia in adapting themselves to changed economic conditions. (See subsequent comment on Figure 4.)

Figure 2 shows that the rate of decrease in the number of private generating establishments has been similar to that of municipal plants. The number of generating stations which are also purchasing has a tendency, even yet, slowly to increase for private ownership while displaying a rapid rate of decrease for municipal plants (Figure 3).

[12] For an explanation of this method and the analysis in connection therewith, the reader is referred to Karsten, *Charts and Graphs* (New York: Prentice-Hall, Inc., 1923), Chapters 32 to 36, inclusive, or any book on statistics.

The rate of increase in number of municipal purchasing plants (Figure 4) marks the shift of municipal establishments from the classification of Figure 3. On the other hand, the private purchasing plants have a decided rate of decrease in number. The explanation is probably the greater flexibility of private ownership. When an electric power plant begins to purchase, the cost of purchased power is less than or at least not any more than the cost of generation by that establishment. Whether the generating equipment is inadequate, obsolete or simply small-scale, is beside the point. The purchasing establishment, including personnel and equipment, is comparatively less efficient than the selling establishment. While personnel cannot be overlooked, equipment is a major factor. And large-scale equipment usually brings economy of production and operating personnel.

So when a small establishment begins to purchase, without extenuating circumstances of temporary handicap, it is an admission of economic inferiority in generation. Private owners meet the situation squarely and dispose of the plant to the better situated establishment. Public owners are often motivated by a pride which resists economic forces sometimes for a short while and sometimes indefinitely. Moreover, the complex procedure involved in the sale of municipal establishments would also introduce a lag in the movement toward integration. These considerations account for the trend of the municipal curve in both Figures 1 and 4.

Wisconsin Establishments by Type of Station

The classification of "generating" plants was further divided into steam, hydro, and gas and oil establishments for both private and public ownership in

CHART III

RATE OF CHANGE OF NUMBER OF MUNICIPAL AND PRIVATE ELECTRIC UTILITY ESTABLISHMENTS IN WISCONSIN: 1882 - 1926

CLASSIFIED ACCORDING TO SOURCE OF OUTPUT

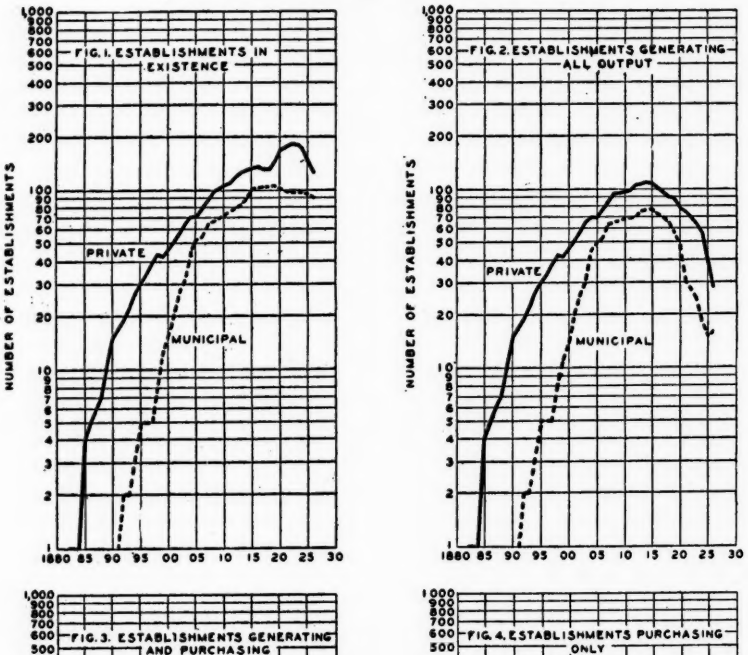


FIG. 1. ESTABLISHMENTS IN EXISTENCE
FIG. 2. ESTABLISHMENTS GENERATING ALL OUTPUT
FIG. 3. ESTABLISHMENTS GENERATING AND PURCHASING
FIG. 4. ESTABLISHMENTS PURCHASING ONLY
NUMBER OF ESTABLISHMENTS
PRIVATE
MUNICIPAL
1880 85 90 95 00 05 10 15 20 25 30

Wisconsin. An establishment was classed as steam when 50% or more of the prime motive power was furnished by steam, although 40% might be hydro and 10% gas and oil. When a hydro establishment is acquired by a steam establishment, a decrease occurs in the number of hydro establishments without an increase in the number of steam establishments. If a hydro establishment were sold to another hydro establishment, the result would be a decrease in the number of hydro establishments. An establishment is included in these classifications even though it is purchasing part of its output.

As Figures 5, 6, and 7 (Chart IV) are examined, a rather marked similarity in the behavior of the rate of change of private and municipal plants will be noted. Steam plants (Figure 5) and gas and oil plants (Figure 7) display a more rapid rate of decrease for municipal than for private ownership. In fact, only one municipal gas and oil establishment remains, although there are still a number of such private plants.

A steam plant has a high operating ratio and unusual increases of operating expenses will quickly force a decision of the question of continued operation. Moreover, as previously stated in describing the technology of the industry, steam plants with large-scale production have a decided advantage over similar small-scale plants. Thus the small municipal and private steam generating plants would tend to decrease in number. Gas and oil plants also have a high operating ratio with a correspondingly quick adjustment to rising costs, if any adjustment other than a complete shut-down is possible. The adjustment would, of course, depend on whether power were available for purchase, or whether steam or hydro generation could be economically substituted for the gas or oil engine.

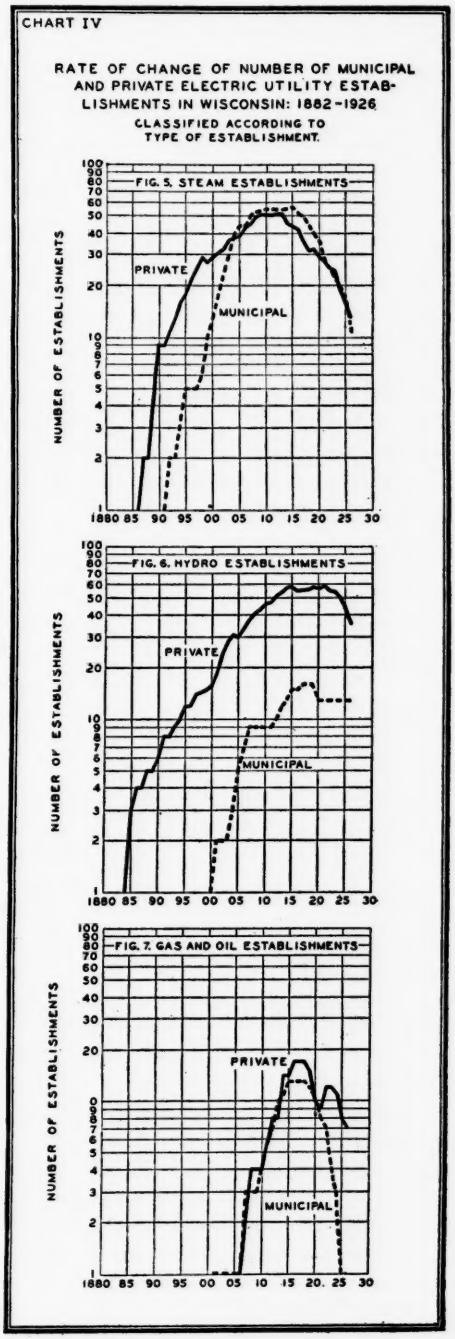


CHART IV
RATE OF CHANGE OF NUMBER OF MUNICIPAL AND PRIVATE ELECTRIC UTILITY ESTABLISHMENTS IN WISCONSIN: 1882-1926
CLASSIFIED ACCORDING TO TYPE OF ESTABLISHMENT.
FIG. 5. STEAM ESTABLISHMENTS
FIG. 6. HYDRO ESTABLISHMENTS
FIG. 7. GAS AND OIL ESTABLISHMENTS
NUMBER OF ESTABLISHMENTS
PRIVATE
MUNICIPAL
1880 85 90 95 00 05 10 15 20 25 30

A hydro plant, on the other hand, has a low operating ratio and, as long as no new capital expenditure is required, the already heavy capital commitment may allow continued operation with abnormal operating expenses rather than suffer abandonment or unfavorable adjustment. But, whereas the rate of decrease in number of private hydro plants has been accelerated (as the result of purchase by steam powered systems) the municipal hydro plants show a six-year tendency to retain their ranks relatively complete for the reason just stated. Figure 6 does not, of course, take into consideration the fact that the municipal plants may be increasing the amount of power purchased. A growing community, which does not wish to be cramped for electric power, would either have to increase the hydro installation, purchase power, install auxiliary generating equipment or sell the municipal plant. Since the capacity of a hydro site is usually limited, the other alternatives will after a period of time change the classification of the plant. The number of hydro plants may then be expected to fall.

Conclusions as to Integration

One of the conclusions from the study of the foregoing material is that small generating establishments, municipal and private, in an area of interconnection, are becoming purchasing plants or a distributing area for an interconnected private system. A purchasing plant is often just an intermediate stage in integration. This conclusion applies, in general, to small establishments regardless of type of ownership. Moreover, the fact that changes in number are occurring more rapidly under one type of ownership than under another is not a reflection upon the type of ownership, and does not by itself warrant an inference that one type of ownership is preferable to another. The technological advances in the mass production of electricity in recent years should be recognized, in the writer's opinion, as a major influence in the rapid reorganization of both private and public portions of the industry.

THE PHILADELPHIA BUILDING AND LOAN ASSOCIATION PLAN OF FINANCING BY SECOND MORTGAGES

By W. N. LOUCKS

The Problem in General

THE crux of the real estate financing problem lies in the second mortgage. To borrow money on a first mortgage on real estate is, and will remain, a relatively easy procedure. However, when the purchaser of real estate attempts to borrow a sum in addition to that borrowed on a first lien and to give as security for such loan a junior lien, difficulties are encountered which often prove insurmountable for legitimate real estate financing projects.

An increasing percentage of home ownership by occupants is generally thought to enhance political and social welfare. However, the desire to own one's own home is often made entirely ineffectual by the discouraging lack of facilities for financing safely and at a reasonable cost that portion of the purchase price between what the purchaser has available in his own pocketbook for a down payment and the sum which he can borrow on first mortgage security.

To be more specific, let us follow the attempts of a hypothetical purchaser to buy a $5,000 home. Assume that $5,000 is a fair price, representing the real market value of the property, and that the prospective purchaser is able and willing to pay down $1,000 from his own pocket. His problem is to borrow $4,000 on security of the real estate being purchased. It will undoubtedly be easy for him to find a bank, building and loan association, or insurance company which will lend him $2,500 on a first mortgage at a reasonable interest rate. Fifteen hundred dollars remains to be secured, and the ability of the potential purchaser to close the deal rests squarely upon the possibility of borrowing this sum on the security remaining after the first mortgage upon the property has been placed.

Should the purchaser request such a loan from his bank, he will be told that the bank is unable to lend him more than $2500 on a first mortgage and is kept from extending credit on a junior lien by both banking laws and conservative banking practice. The reply of insurance company officials will be similar. They must place their funds only in ultra-safe investments and consequently limit their real estate loans to one-half of the market value of the property on first mortgage security.

Should he seek a loan covering this $1500 from a building and loan association, supposedly the mecca of home purchasers, he will receive more encouragement. He can borrow more than one-half, possibly even two-thirds, or, in this case, about $3500, from the association. However, it must all be on first mortgage security and he will be required to repay the entire sum in the course of 10 or 12 years in monthly payments large enough to cover interest as well as amortization of the principal. Since, as owner of the property, he will be called upon from time to time to meet such additional payments as insurance, repairs, taxes, these monthly building and loan payments will probably appear burdensome and the purchaser may decide to finance the project in the only remaining way,

that is, by borrowing $2500 on a straight first mortgage from a bank or insurance company and seeking the remaining $1500 from a private lender or mortgage company lending on second mortgage security. Just how he would fare in the hands of such lenders will be discussed in more detail later, but it will suffice here to say that the conditions usually imposed are so onerous that the borrower who realizes what they actually mean will probably be strongly inclined to remain a tenant indefinitely.

In short, this prospective home purchaser has found that there is no established agency which will handle such financing at a cost he can afford to bear.

Nature and Extent of Philadelphia Plan

In one city, however, our hypothetical[1] purchaser would encounter a wholly different situation. In the City of Philadelphia a unique plan of second mortgage financing which is highly favorable to the borrower has been in operation for many years. The purpose of this article is to describe and evaluate this plan of second mortgage financing which will be hereafter referred to as the "Philadelphia Plan."

The prospective home purchaser in Philadelphia would proceed in the following rather standardized manner: After paying $1,000 from his own funds, a sum representing his original equity in the property from the time of purchase, he would borrow from a bank, insurance company, or private lender about $2500, giving as security a first mortgage on the property being purchased. This first mortgage loan would be arranged as a straight loan requiring only interest payments during its life. Although it would be a three- to five-year loan, there would be one or two or possibly more renewals. Such a first mortgage loan having been secured, the purchaser would go to a building and loan association and apply for a loan of $1500 on second mortgage security. Should an examination of the property and the reliability of the borrower yield satisfactory results the association will lend the $1500, taking a second mortgage on the property as security. By the terms of this plan this second mortgage loan should be repaid over a period of 11 to 11½ years through the installment purchase by the borrower of one share of the association's stock for each $200 of the loan. The borrower also pays interest on the loan while it is outstanding. The second mortgage loan having been repaid, the borrower would then turn his attention to repayment of the first mortgage loan.

The advantage of this plan to the borrower is obvious. His monthly obligations in addition to repairs, taxes, insurance, etc., include according to the illustration, interest on the straight $2500 first mortgage loan, interest on the $1500 second mortgage loan, and monthly installment payments on $1500 of the association's stock to liquidate the second mortgage loan. In contrast to this, the purchaser under the ordinary building and loan plan would be required to pay interest on the $4000 first mortgage loan, if he had been so fortunate as to get a loan covering as much as 80% of the value of the property, and monthly payments large enough to liquidate the entire $4000 in 10 to 12 years. It is very apparent that the Philadelphia plan is a means of reducing the monthly obligations of the purchaser although, of course, he does not become the possessor of an unencumbered title as soon as he otherwise would.

Despite the fact that this plan has had a long and extended use in Philadelphia, no attempt previous to this has ever been made to survey comprehensively this method of financing. Although the

investigation was hampered by inability to get certain data which were desired, it is nevertheless felt that a partial analysis will be of value in view of the widespread suspicion and misunderstanding with which the Philadelphia plan is looked upon outside that city.

The investigation,[1] which ended something more than a year ago, centered around two questions: First, what does second mortgage money borrowed under the Philadelphia plan cost the borrower? Second, are loans made on second mortgage security under the Philadelphia plan safe?

In the cited illustration the association lent on second mortgage security up to 80% of the value of the property after a first mortgage covering 50% of the value had been taken as security for a loan by a bank or other mortgage financing agency. Of the 200 Philadelphia associations included in the sample upon which this study is based, four-fifths will, under satisfactory conditions, lend on second mortgage security a sum which will bring the total of the first and second mortgage loans up to 80% of the value of the property. Although a few of the associations studied indicated a willingness to go beyond this, the usual procedure is for the association to grant a 30% loan in addition to the 50% granted by some other financing agency on a first mortgage. It is to be noted that the associations which make these second mortgage loans almost never hold the first mortgages on the same properties.

The 3400 building and loan associations of Philadelphia can be divided into three groups. Those in the first group, which according to our study includes about 14% of all the associations, lend only on first mortgage security; the second, including the associations which make advances only on second mortgages, constitutes about 17% of the total; while the third group, or those which lend on both first and second mortgages (the seconds being on different properties than the firsts), includes about 69%. The importance of second mortgage loans in the business done by the associations in this third group is indicated by the fact that more than one-half of these associations have more than one-half of their loans on second mortgages. In fact, the Philadelphia plan is used so extensively in that city that practically all of the second mortgages placed on homes are financed through building and loan associations. At the present time there are probably more than $250,000,000 of these second mortgage building and loan loans outstanding.

I. The Cost of Second Mortgage Money under the Philadelphia Plan

An analysis of the Philadelphia plan discloses the highly standardized nature of the specific charges made by the Philadelphia associations for second mortgage money. A brief statement of the various items of cost which the borrower is called upon to pay is set forth below. The first three are monthly obligations which continue during the entire life of the loan, that is, until the shares being purchased are fully paid for, whereas the remaining seven items are paid but once during the life of the loan. It must be borne in mind that these charges apply to second mortgage loans only.

[1] Information concerning the use of this plan was secured from about 200 Philadelphia building and loan associations. These associations constitute about 6% of all the associations in this city and hold nearly ¼ of the total assets of the Philadelphia associations. Since the investigator had no power to force the associations to supply data, all information received was voluntarily given. The application of various checks to the data indicates that its voluntary nature does not depreciate its value for purposes of analysis.

1. Interest Rate: A standard interest rate of 6% is charged for second mortgage loans. This the borrower is required to pay each month on the full amount of the loan until it has been completely repaid.

2. Premium: Competitive bidding among borrowers was the origin of this cost item. In the early history of the Philadelphia building and loan business, borrowers bidding for funds held by the association offered premiums in addition to the regular interest rate. The loan went to the borrower who offered the highest premium. From this situation has developed the present premium practice which requires the payment of a definite premium by all second mortgage borrowers in addition to the interest rate. Legally, this premium may go as high as $.33⅓ per $200 share per month. In actual practice there is a nearly standard charge of $.25 or $.30 per share per month. This premium is in reality an additional interest charge and must be paid during the entire life of the loan.

3. Monthly Payment on Shares: This is the monthly installment of $1.00 per share of $200 par value which the borrower pays toward the purchase of stock in the association. When these shares are fully paid for, they equal the face of the loan.

4. Entrance Fee: Admission to membership in the association is automatic upon the granting of the loan but is contingent upon the payment of this fee. Just why such a fee is charged is not very clear but it is usually represented as caring for a portion of the overhead expenses of the association, such as the cost of issuing shares, keeping records, etc. The practically uniform practice is to charge the borrower $.25 per share when the loan is granted. This is sometimes referred to as a membership fee.

5. Appraisal Fee: Appraisal of the property to be used as security, before the loan is granted, is generally done by a committee consisting of three officers of the association. For this service the committee receives a nominal fee varying from $3.00 to $6.00, which the borrower pays. One of the outstanding features of the Philadelphia plan is the careful appraisal.

6. Title Insurance: The purpose of this charge is to eliminate the risk of having the security back of the loan impaired through future discovery of some defect in the title to the property. The borrower is therefore required to take out in the name of the association title insurance equal to the amount of the loan and to bear the cost of this insurance, which in Philadelphia amounts to about $35.00 to protect an equity of $1000.

7. Fee for Recording Mortgage: This fee, which the borrower must of course pay, amounts to about $6.50 for a standard second mortgage.

8. Sheriff's Sale Certificate: The lender on second mortgage security is always in danger of having the security back of the loan impaired by the foreclosure of some prior lien. In Philadelphia it is possible to purchase from title insurance companies certificates guaranteeing that the second mortgagee will be informed immediately upon the filing of a foreclosure proceeding on any lien prior to the second mortgage. This certificate, for which the borrower must pay, costs $10.00 for the life of the loan.

9. Solicitor's Fee: This fee is paid by the borrower to the solicitor or conveyancer who draws up the deed and the mortgage, sees that each is properly recorded, and arranges other legal details. It is sometimes called the conveyancer's fee, or the fee for "making settlement," as this part of the procedure is termed in

Philadelphia. Its amount varies, but usually does not exceed $25.00 for a loan of from $1000 to $1500.

10. Commission: A fee for the "go-between" who arranges for the loan is sometimes another cost item to the borrower. This function of advising prospective purchasers and representing them before the association in presenting an application for a loan is sometimes performed by a man more or less closely connected with an association. Some difference of opinion exists in Philadelphia as to the legitimacy of the charge for this service, but since in fact the borrower is sometimes called upon to remunerate a "go-between" such a payment, when made, must be included in the cost of the second mortgage loan. It is illegal in Pennsylvania for an officer of an association to act in such a capacity for compensation but considerable suspicion exists that it is sometimes done. However, if, at the time the application for the loan is presented, the applicant is a member of the association, possibly a non-borrowing depositor, the practice is to charge him no commission. As a matter of fact, a great many borrowers, even non-members, do not have to pay commissions for loans. When these commissions are charged they exceed 5% of the amount of the loan so rarely that 5% or less may be considered the usual charge.

Several other conditions which affect the net cost of the loan must also be noted:

Number of Shares the Borrower Must Carry: Reference has already been made to the fact that the borrower is required to buy shares of the lending association's stock equal in par value to the amount of the loan paying therefor in monthly installments. In exceptional cases extra shares must be carried, but the usual requirement is one share for each $200 of the loan.

Maturity Periods of Shares: The length of the period over which the borrower must continue payments on the purchase of these shares and thereby repay his loan obviously has an important bearing on the net cost of the loan. These "maturity periods" vary because they depend in part upon the profitableness of the individual associations. In all but exceptional associations they range from 132 to 138 months.

Allowance to Withdrawing Members: Should the borrower decide to repay his loan in its entirety before his stock in the association has matured he may do so, but he will not receive the entire amount of profit which an accounting of the affairs of the mutual association would show to be due to his shares. Various schemes for making allowances of partial profits to withdrawing members are in use. These need not be discussed beyond noting that, if the borrower repays his loan and withdraws before his shares mature, the cost of his loan will slightly increase.

Fines: Philadelphia associations levy 2% fines on all overdue obligations of borrowing members.

The calculation of the total net rate paid for second mortgage money should fairly include only those charges which the home purchaser would not have been required to pay had he paid cash, but which he does have to pay because he is borrowing the money. Therefore, our calculation includes interest, premium, monthly payments on shares, entrance fee, appraisal fee, fee for recording the mortgage, cost of sheriff's sale certificate, and commission, but *not* the cost of title insurance, on the assumption that the purchaser would protect his title by such insurance whether or not he borrows; and we include only a part of the solicitor's fee on the assumption that some papers would have to be drawn up and

detail work cared for, no matter how the funds were acquired, although this expense would not be as great if the sale were for a cash consideration.

Accordingly, the items of cost in calculating a total net rate on a $1000 second mortgage loan were listed as follows: Interest, $5.00 per month; premium, $1.50 per month; payment on shares, $5.00 per month; entrance fee, $1.25; appraisal fee, $6.00; fee for recording mortgage, $6.50; sheriff's sale certificate, $10.00; commission, $50.00; solicitor's fee, $15.00. The assumptions were made that the borrower does not repay the loan until it is due, that is, until the shares he is carrying have matured, and that he has no fines on arrearages to pay. Also the maturity period of shares was assumed to be 138 months.

The problem then was to resolve all of these cost items into a total net cost rate paid for the loan. For this purpose a formula set up by H. F. Clark and F. A. Chase in their book, "Elements of the Modern Building and Loan Associations" was adopted. In using this formula, all of the payments made but once, such as the entrance fee, appraisal fee, fee for recording the mortgage, sheriff's sale certificate, commission, and solicitor's fee were deducted to find the net loan, and the rate was computed on the basis of this net loan. This, of course, means that the items just mentioned are all included in the actual rate found to be paid.

A calculation on this basis shows that the borrower pays 12.8% for his second mortgage loan. However, it will be noted that this calculation takes the largest amount in the cases of several variable items and it is obviously unfair, therefore, to take 12.8% as the usual cost of second mortgage funds to the usual Philadelphia borrower. Rather, this would be the cost to those borrowers who encounter the most unfavorable conditions in their financing.

It is apparent that another calculation should be made to find the rate paid by the large number of borrowers who unquestionably encounter charges less than those used above for some of the items. In this new calculation a premium of $1.25 per share per month was substituted for that of $1.50; the commission charge was eliminated since so few borrowers have to pay one, and since, moreover, all borrowers could free themselves from such a charge if they would plan ahead and become non-borrowing depositors a few months in advance of the time they expect to apply for a loan; and a maturity period of 136 was used instead of 138 months, because so many associations have maturity periods of 136 months or less.

This new calculation results in a cost of 9.4%, which probably more nearly represents the usual cost of second mortgage money borrowed under the Philadelphia plan. To summarize, although some borrowers probably pay less than 9.4% or more than 12.8%, the usual cost is between these two rates, tending to be much nearer the former than the latter.

In considering this cost rate it must be remembered that the calculations are based upon a $1000 loan and that some of the items of cost would not increase proportionately with increases in the amount of the loan. For instance, the appraisal fee, the fee for recording the mortgage, and the cost of the sheriff's sale certificate would not increase at all, while the solicitor's fee might increase, but possibly not in proportion to increases in the amount of the loan. This simply means that the net rate paid for the loan would decrease as the amount of the loan increases and that if we had

used a larger loan in our calculation a lower rate cost would have resulted.

It is no less important to note the inclusiveness of the calculated cost rate. Items such as the appraisal fee, fee for recording the mortgage, cost of the sheriff's sale certificate, and the fee for drawing up the legal papers have all been included. Even the borrower might not include these when thinking of the cost of his second mortgage loan, but in order to get what can truthfully be called the *total* net cost of the loan such items should be considered.

Is the Cost under the Philadelphia Plan Excessive?

Is the cost of second mortgage money under the Philadelphia plan fair and reasonable? The discussion of this question is hampered at the outset because standards as to the fairness and reasonableness of charges are practically nonexistent in the field of second mortgage financing. Comparison of the cost in Philadelphia with the cost of second mortgage money elsewhere is the only alternative.

The investigation of this phase of the problem extended to Cleveland, Detroit, Pittsburgh, Baltimore, Chicago, and New York, as well as to a group of smaller cities. Information as to second mortgage financing costs was also received from about 25 state banking departments. The following summary and generalizations are based on this information, although the details of second mortgage financing conditions in specific places are at the same time interesting and startling. It is to be remembered that outside Philadelphia second mortgage financing is almost entirely in the hands of second mortgage companies and private lenders. These agencies are often unregulated or evade attempted regulation in their drive for large profits.

Taking care to be duly conservative, we may say first that, outside of Philadelphia, second mortgage loans are practically never granted for a longer period than three years and in a great many places not in excess of one or two years, whereas a second mortgage loan under the Philadelphia plan runs without renewal for 11 to 11½ years, or until the shares the borrower is purchasing have matured. In the second place, it is important to note that outside Philadelphia the extra costs of various sorts are both numerous and large. For instance, one large mortgage company in a city near Philadelphia, under the heading of "How to Buy a Home on Easy Terms," states its charges to include, in addition to the interest rate, a "service charge" of 4% per annum for renewal (this company grants second mortgage loans for only one year at the end of which renewal is necessary), and in addition the borrower must pay for drawing up the legal papers, search of title and recording of the mortgage. From a large midwestern city comes the information that the "prevailing" charges for second mortgage loans are, in addition to the "6% or 7%" interest charge, "10% commission per year for the use of the money" and that in addition to this "the borrower pays a mortgage tax on the mortgage . . . and he also pays attorney's fees for drawing up the papers and examining the abstract." In comparison with such charges, the commission sometimes paid by the borrower in Philadelphia to a go-between is almost negligible.

Moreover, the insidious practice of discounting second mortgages is very prevalent outside Philadelphia. Mr. Samuel N. Reep reported after a comprehensive survey of second mortgage financing costs in 1925: "On the average I found that companies were discounting one-year paper at 10%, two-year paper

at 15% and three-year paper at 20%, while in some localities, there was a distinct attempt to make only one-year paper at a discount of 10%, charging the same discount the following year for renewal."[2] Our study leads to the conclusion that this description is still applicable to second mortgage financing in a great many places.

However, the discount does not represent the actual rate paid per year for the borrowed money. Discounting a $1000 second mortgage at 10% for one year means that the borrower receives from the lender only $900, whereas at the end of the year he must repay $1000 plus interest on $1000 at probably 6% for the year. A simple arithmetical calculation shows that such a borrower pays for his money an actual rate of 17.8% a year, exclusive of all expenses incidental to the loan, such as drawing up the papers. If this loan were for two years, with a discount of 15%, the actual cost including only interest and discount would be 15.9% a year. If it were for three years with a discount of 20%, the actual rate would be 15.8% per annum. The discounting of second mortgages is practically unknown in Philadelphia.

It would be interesting but useless to prolong further this description of second mortgage financing costs outside Philadelphia. A mass of data shows the conditions cited to be general. Although doubtless borrowers elsewhere may get second mortgage loans at lower rates, it would be safe to say that the usual cost of second mortgage money outside of Philadelphia, if calculated on the same basis as in this study, would range from 15 to 20 or possibly 25% a year.

The evidence amply justifies the application of the term "reasonableness" to the cost of second mortgage loans made by the building and loan associations of Philadelphia. In fact, to add a degree of definiteness to the comparison, we may say that the cost of second mortgage funds elsewhere is rarely as low as the 12.8% which was found to be the net cost to those Philadelphia borrowers who pay the highest rate for their money. Since Philadelphia second mortgage borrowers as a whole pay something less than 12.8%, probably around 10%, we can concur in the challenge made at a meeting of the Mortgage and Finance Division of the National Association of Real Estate Boards several years ago (which, by the way, was not made by a Philadelphian): "If there is any other section of the country that can produce a second mortgage at the rate Philadelphia can produce it, I would like to know where it is."[3] We conclude that the Philadelphia plan meets satisfactorily the first test applied: reasonableness of the cost of the second mortgage loan to the borrower.

The second test—the safety of loans made on second mortgage security under the Philadelphia plan—will be considered in the second installment of this article in the next issue of the *Journal.*

[2] *National Real Estate Journal*, p. 47 (June 29, 1925).

[3] Proceedings, Mortgage and Finance Division, National Association of Real Estate Boards, p. 73 (1923).

SHOULD BARE-LAND VALUES BE TAXED MORE HEAVILY?

By HARRY GUNNISON BROWN

Subjective versus Objective Approach

The old saying that "possession is nine points of the law" might well be applied to our economic practices and institutions. It is exemplified in our attitude towards taxation, for whatever method of taxation happens to hold the field at any given time is difficult to dislodge. Doctrines of alleged fairness cluster about it and habituation lulls discontent. A similar psychology causes people to question the new and unfamiliar. So even a tax system as far removed from our present practice as the "single tax on land values" would probably have among its supporters many of those who are now most definitely opposed to it, if only they had been accustomed to it from youth, had been surrounded by others equally accustomed to it, and had learned the arguments best fitted to defend it instead of those used to defend the tax system we now have.

In the case of any controversy between adherents of substantially our present taxation system and adherents of site-value taxation, the only really objective basis of comparison is one that has reference to the effects, whether observed or indicated, of these divergent tax policies. On the reasonable assumption that the nature and consequences of the existing system are the more familiar, I shall be mainly interested here to show what consequences, be they good or bad, might be expected from the substitution of the system of site-value taxation.

Incidence of Land-Value Tax

At the outset it is important to make clear two facts. One is the fact that a tax on the rental value of land cannot be shifted. The other is that the value of land is not to be arrived at in exactly the same way as the value of produced capital.

That a tax on the rental value of land cannot be shifted either in higher rents to tenants or in higher prices for goods, economists generally insist. Such qualifications as may be made to this statement (however interesting they may be to the theorist) are of little practical importance and need not here be discussed.[1] As a general proposition there can be no question that a tax on the rental value of land, applied equally whether the land is used or not and regardless of how used, is not shiftable and, indeed, may even, by forcing speculatively-held land upon the market, cause land rents to fall.

It is unnecessary to go at length into the argument that a tax on land values cannot increase rents. Suffice it to say that if such a tax did raise rent, people would economize in the use of land just as they economize in other things when they must pay higher prices for them. Thus, more land would be left unused than if the rents had not been raised, and the owners of such unused land, rather than lose all income from it while yet having to pay the new tax, would quickly reduce rents to the former level.

Valuing Capital versus Valuing Land

The value of capital as distinguished from land depends on its cost of produc-

[1] The reader who is interested in a consideration of these qualifications will find them in Harry Gunnison Brown, *The Economics of Taxation*, (New York: Henry Holt & Co., 1924), pp. 219–232.

tion—or of reproduction. The value of land depends solely on its expected future income and the current interest rate at which this income is capitalized. This is a basis for the contention that a tax on land has different effects—be they better or worse—than a tax on capital.

Extreme statements usually need qualification and it is not at all my intention to assert that the value of capital is causally influenced only by the cost of producing or of replacing it. The value of any piece of capital, e. g., a steamship, is undoubtedly related to its expected future yield. If it chance to be unseaworthy, its having cost a million dollars to build will not make it worth a million. Likewise, if built for use in a river or lake from which it cannot be moved but where no sufficient demand for its services develops, a vessel will not be worth as much as it cost to build.

Of course, the estimated value of the future services of a ship (as of any piece of capital) is an essential element in determining its present capital value. But this is not the only element. Cost of production (contemporary cost, i. e., cost of reproduction) is a no less essential element. No matter how valuable the expected future services of a steamship, if another just like it can be built now for a million dollars the one already built can hardly be sold for five million dollars or for two million or even for a million and a half. Except as influenced by some necessity of immediate use or by some other special and unusual circumstance, a buyer will not pay for any instrument of capital substantially more than its current cost of reproduction. Nor in any case, could sellers, for long, charge more, for a higher price than this would make the business of supplying such capital more profitable than other lines of business and would tempt new competition, so lowering the price. On the other hand, a lower price than this would cause construction of such capital to cease. As a long-run proposition, then, the value of capital is, of necessity, not much above or below its current cost of production (cost of duplication.)[2]

But in the case of land, *there is no cost of production or duplication.* No individual and no group of individuals can duplicate Wall Street or the loop area of Chicago. I am not attempting to argue here that no group of individuals is ever in a position strategic enough to start a city. Still less am I contending that never can any individual or group purposely and effectively bring about a change in the value of a specific small piece of land. I have discussed elsewhere[3] the contention that these things may sometimes and in some degree be accomplished and have, I hope, made the requisite allowances. But, after all, the topography, land and water, of the earth is not essentially a matter of human causation, and the establishment of the advantages of specific sites or pieces of land is in only slight degree a matter subject to the conscious and purposeful control of individuals or business groups. I think the reader will see that I am not insisting on any extreme and unqualified view, even though the limits of space make it desirable that I do not now develop the possible qualifications, as I have elsewhere. But, with or without qualifications, the general nature of the difference between capital and land which I am here trying to make clear, will be admitted by most sensible persons once they understand the terms in which it is stated.

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[2] For analysis and criticism of possible objections, see Harry Gunnison Brown, *Economic Science and the Common Welfare*, (Columbia, Mo.: Lucas Bros., 1926, 3rd ed. pt. II, Ch. IV, secs. 5, 6 and 9.

[3] *op. cit., supra* n. 1, pp. 219–232.

To illustrate, Smith contemplates purchasing a lot and a building for the purpose of starting a retail store. Jones offers him exactly the lot and building that he desires, asking a price for the two of $50,000. An equally satisfactory lot, adjacent to the first, is obtainable for $20,000. Smith realizes, therefore, that the extra $30,000 is really a payment for the building. Suppose, however, that an equally good building for his purpose, perhaps an exact duplicate of the one Jones has, can be constructed for $20,000. He will then, clearly, refuse to pay $50,000 for Jones' lot and building and will consent to pay only about $40,000. The possibility of constructing another building limits the price Smith will pay for this one. But no such possibility limits the price he will pay for the lot since, in the case of the lot, no such possibility exists. If Smith is not satisfied to pay $30,000 for this specific building he may, indeed, look for another building (which, however, someone had to construct, so that cost of construction will affect supply and, therefore, value), as, if not satisfied with the price of the lot, he may look for another lot. But he can also *construct* an additional building, duplicating the one desired, and he can *not* construct a new lot. There is, in short, one more alternative open to him with regard to the building than with regard to the lot.

If development of the tributary territory or increased population of the city in question brings it about that this site (and, also, the adjacent unimproved lot) promises to the user a much larger annual return than before, competition will compel Smith, if he would possess the lot, to pay a much higher price. Neither Smith nor any one of his possible rivals for the site will be dissuaded from purchasing it at a markedly higher price than the $20,000 it was worth under the circumstances first assumed, on account of any idea that he can make or construct such a site at lower cost. Nor will the fear of any such preposterous eventuality cause the owner of the lot, or of any similar lot, to charge any lower price than seems now to be justified by its probable future yield.

Let us, then, put the valuation of lots in terms of arithmetic. Suppose a lot to have, because of its situation, an expected net yield of $1,000 a year in excess of a reasonable return on the capital invested or to be invested in improvements. And suppose the general rate of return yielded by capital in excess of allowance for depreciation to be 5%. Then the lot in question should sell at $20,000. If the owner confidently expects it to yield him $1,000 a year and knows that $20,000 available to invest in capital construction or otherwise would probably yield no more, he will hardly want to sell for less than $20,000. If the prospective purchaser believes he can make $1,000 on an investment of $20,000 in capital or by lending it to some one for the construction of capital, he will hardly want to pay more than $20,000 for the lot.[4]

[4] Here, as elsewhere, some little qualification may be desirable. Many buyers and sellers of lots probably make no calculations regarding probable actual yields. They sell for what they can get or buy for a price that corresponds to what others seem to be paying. They may buy solely for speculation intending to sell to others for as much as they can persuade the latter to give. But would-be purchasers of land who themselves wish to use it productively can scarcely afford not to calculate the probable future advantage or yield of the sites they would purchase. And would-be sellers who are themselves capable of using the land they would sell are unwise unless they too make such calculations. Even the would-be buyers and sellers who do not themselves so calculate are bound to be affected, at least indirectly, by the estimates of those who do. Thus we get back, inevitably, to our original basis for the valuation of land, viz., its expected future net yield and the current rate of interest.

Different Consequences from Taxing Capital and from Taxing Land

Now we are prepared to inquire whether a tax on land values, taking any given proportion up to 100% of the rent (actual or, in the case of speculatively-held land, potential) will have the same or different consequences from a tax on produced capital, e. g., on improvements. The fact is that the former tax will reduce the selling value of land, while the latter will not, as a long run proposition, reduce the value of capital, for capital is constantly wearing out and requiring replacement and, unless it is worth what it costs, men will not reproduce it. A very heavy tax on capital may, indeed, discourage its construction. It may, possibly, by reducing the reward of saving, make thrift seem less worth while. It may thus leave the community with less adequate equipment for the forwarding of industry and may so, conceivably, bring about widespread poverty. But in so far as capital is saved and constructed, despite the possible discouragement of the tax upon it, such capital must, in general, be worth as much as it costs to construct.

Since the value of land, on the other hand, is determined solely by capitalizing at the current rate of interest the net rent which its owner can expect to receive from it, a tax which decreases what the owner can receive will necessarily make the title to the land less valuable.

The owner of a specific piece of land will not necessarily have his total income reduced by such a tax, if it takes the place of a tax previously levied on all property. Indeed, in case his land is highly improved, his net income will very likely be *larger* than before, since to remove the tax from his valuable improvements will probably save him more than the increased tax on his less valuable land will cost him. But *the total salable value of his property will be less*, since the improvements cannot be worth more than their cost of duplication and since the value of the land must be lower than if it were not taxed.

It does not follow that the property owner is any worse off. Although, if desiring to sell, he would have to dispose of his property at a lower price because of the effect of the tax on the salable value of the land, he could for the same reason buy another piece of land at an equally reduced price.

Regardless of whether or not important objections to increased land-value taxation exist, I cannot avoid the suspicion that at least a considerable part of the opposition to it among real estate men arises from a failure to distinguish clearly between taxation of bare-land values and taxation of real estate. I am not here trying to say that the so-called "single tax" would be a lighter burden on real estate in general than real estate now bears. I am rather emphasizing the general principle upon which the single-tax propaganda is based, viz., that the rental value of land, as a community-produced value, is peculiarly fitted to be a source of public revenue. This principle is quite consistent with a *lower* tax on a *great deal* of real estate than the tax now levied upon it. Also it would be consistent with such a lower tax even if all the rental value of land were taken by the public. If no more was taken—and a tax on rent can of itself hardly take more than all the rent there is—nothing whatsoever would be taken from the earnings on the improvements, however extensive or however large their earnings. If such a tax on bare-land rent, even at 100%, could not provide all the revenue needed by government, the remaining revenue required might be raised in various other ways, such as

through inheritance, income and consumption taxes, and need not involve any further tax on real estate as such.

An Arithmetical Contrast between Two Tax Systems

In order to make as clear as possible the distinction between bare-land-value taxation and taxation of property in general, let us suppose part of the United States to have one system and part the other. Then we can, at least mentally, compare the two systems advantageously, with a view to determining how each would affect the economic welfare and the industrial development of the territory where it is assumed to be in operation. Let us suppose the new system, viz., land-value taxation, to be in effect in the Coast states, both Atlantic and Pacific, and the old system to be still in effect in the Mississippi Valley states.

We shall consider the problem first in terms of arithmetic, in order to avoid as far as possible any lurking prejudice or sentiment. Then, perhaps, we can all agree as to what are the differences in the effects likely to be produced, however cordially we may later disagree regarding our desire or lack of desire that either set of effects be sought.

It will make the argument clearer if we assume, at the outset, a definite figure for the return to capital. We shall suppose this to average 7% throughout the United States. But in the central area, where all property is taxed, the tax takes about 2%, leaving a net return on all improvements made and all other capital of 5%. Since lenders can get about 5% and since owners of real estate can make 5% on their improvements, no one can afford to buy land (or, having some, to buy more) at a price so high that the future net rent (after tax subtractions) is less than 5% of the price he pays. No owner of land will wish to sell at a price so low that the interest he can earn, after investing the sale price in capital, amounts to less annually than the net rent he would get from the land.

Now we are ready to make our illustration more precisely arithmetical. Suppose a certain person has improvements on his land in the form of one or more buildings worth $6,000 and which could be duplicated for $6,000. The yield, at the current rate here assumed for the Mississippi Valley states, is 7%, or $420 in excess of allowance for depreciation. But of this $420, the sum of $120, or 2% on the capital, is taken in taxation. Thus a net return of $300 or 5% remains.

So far we have made no allowance for rent of the lot. Because of its situation an excess return of $280 is secured above the ordinary interest on capital and this is properly to be regarded as *rent* (land rent or site rent or economic rent). If the surplus $280 were received for efficiency in managing a business, it would not be rent. But as it is $280 in excess of interest on the value of the improvements and can be secured by the owner without productive work on his part, being paid to him by some one else desirous of using the lot, it is properly to be placed in the rent category.

If taxes on rent take ⅐ of the entire rent, as we assumed to be the case with the $420 return from the improvements, then $80 of the $280 will be taken in taxation, leaving $200 as net rent. Since the current net interest rate is 5%, a lot which is expected to yield $200 a year net should normally be worth that sum of which $200 is 5%, namely $4,000. Then we can say that the land and improvements together are worth $4000+ $6000 or a total of $10,000, that the yield is 7% of this or $700, that the tax is 2% on the salable value (⅐ of the in-

come) or $200 and that the net yield is $500 or 5%. The owner, in practice, may not distinguish his land from his capital and may consider simply that he has a net return of $500, or 5% on a $10,000 investment. Yet, however unconscious of it he may be, the fact is that the value of the capital depends largely upon and cannot appreciably exceed its current cost of production, while the value of the land can be arrived at only by capitalizing its expected future rent at the current interest rate.

Now compare one of the sections where a tax on the rental value of land was assumed to have replaced the general property tax. To make the comparison clear we shall suppose in this territory a case similar in the value of the improvements and in the location advantages of the land. Then we shall have the improvements worth $6,000 with a yield above depreciation of $420 or 7%. And there will be an additional return, due to advantageous situation, of $280.

According to our assumption no tax in this territory was levied on real estate improvements, whether buildings, orchards or drainage systems, or on any other capital. Whatever tax would have been levied on these items rests on the rental value of land. Instead of taxing the improvements $120 and the land $80 (3/7 of the actual or potential annual income in each case), the tax rate is made high enough on the bare-land value to secure the same total of revenue. This means, if the proportionate returns from land are 3/8 what they are from improvements, as in this case, a tax rate on the land of not less than 3/7 of the rental yield. Thus, the tax on this particular piece of land would be $200, leaving a net rent of $80. (If this tax, resting equally on valuable unused land, forced such land into use and so somewhat reduced rents, the remaining net rent from such a piece of land might be between $75 and $70 instead of $80.)

The net return on improvements, since these are not taxed, will be $420 or 7% instead of $300 (or 5%), and the net rent on the lot, after the tax is subtracted, will not exceed $80. What is the bearing of these two facts on the salable value of the lot? Since investment in improvements will net 7% instead of 5% and since borrowers who wish to make improvements can afford to pay about 7% interest and, because of competition for funds, would have to pay substantially that,[5] land would tend to be valued by capitalizing its rent on a 7% basis. The lot in question should therefore be worth that sum of which $80 is 7%, or about $1143 ($1142.93–), instead of $4000 as in the territory where all property is taxed alike.

To purchase a piece of land and construct on it $6000 worth of improvements, in order to get a net yield on both after taxes of $500 ($300 on improvements and $200 rent on land), would require, where property in general is taxed, an initial accumulation of $10,000. Where the entire tax in question is on bare-land values, the amount necessary to save in order to secure an equal income (in this case $420 on improvements and $80 on land) is only $7143. The requisite investment is almost $3000 less for the same income. In other words, the person who works and saves for the purpose of making improvements in or on land or of starting a business can secure a net return of 7% as easily as he could secure 5% if capital were taxed.

Factories, stores, office buildings and houses cannot well be moved from the territory where they are taxed to the

[5] Except as, possibly, kept down by inflow of funds from the area where capital is taxed. See the next paragraph but one.

territories where they are not taxed, but future construction resulting from new accumulations or savings will be undertaken by preference in the territories where they are not penalized.[6] After all, the average investor does prefer a 7% untaxed return to a return of only 5% (7% minus a tax of 2%). Indeed, we may safely guess that a very large portion of the more conservative business men in the Mississippi Valley states, of those most bitterly opposed to any substitution of land-value taxation for other taxes, would be the quickest to send their own savings into the Atlantic Coast and Pacific Coast states where such savings would yield the higher net returns. This might be most unfortunate and an evidence of lack of loyalty to their professed principles on the part of the conservative persons in question, but there is little doubt that they would be definitely so influenced.[7]

What then? If more and more funds flow into the Atlantic and Pacific Coast states for investment, the amount and quality of land improvements, buildings and equipment in these sections will increase. This will doubtless tend to lower the net return on capital towards that of the Mississippi Valley states, while raising it in the last-named section through a progressive scarcity of capital. The greater amount of capital in the Atlantic and Pacific Coast states should facilitate improvement in methods of production, add to the efficiency of labor, make the productivity of labor, therefore, high, and tend towards high wages and large returns to enterprise.

[6] Of course it will be said, and with some justice, that the flow of investment is likely to make impossible the continuance of such a difference in rates of return on improvement. Such an objection, however, if made, would be at the same time a significant admission. It would be an admission that the territories which tax bare land more and improvements not at all are more desirable or profitable places for investment than the territory which continues to tax all property alike.

There is, furthermore, another possible influence which we ought not entirely to overlook, the influence of heavier bare-land-value taxation on the speculative holding of land out of use. Without now discussing this problem fully or inquiring whether or not any good purpose is ever served by such speculation, we may surely say that in so far as good land is held out of use by speculators, land is for the time being made artificially somewhat scarcer than it otherwise would be, rents and sale prices of land are made higher and wages are made lower. Forcing good land into use has at least three results: more remote and otherwise poorer land need not for the present be used; industry is thus more productive; and the active factors in industry as a whole are better paid.

We have seen that new capital will tend to flow to the Atlantic and Pacific Coast territories where capital is not taxed; that new ventures will prefer to start there, assuming other conditions equally good; and that land for the establishment of these ventures can be obtained there more cheaply. But how about the ordinary wage earner? Is he in any measure a gainer? Will he too prefer the land-value-tax territories to the general-property-tax region?

It is, indeed, very hard to conclude otherwise. Suppose that we consider seriatim the advantages to him of the land-value-tax system. He finds that the territories which apply it are—or

[7] Clearly, we must guard against the danger of exaggeration. Even though net returns on all new investments were raised by 2% in the coast states, while remaining the same in the valley states, this might not at once greatly affect the flow of investment. Only as education of investors proceeded to the point where they really comprehended the effects of the policy, or at least became cognizant of the difference in net per cent. return, would they be influenced. But it is truly difficult to avoid the conclusion that sooner or later such a flow of investment funds must occur.

soon become—better supplied with capital. This makes his labor more effective and, therefore, more in demand, and so tends towards high wages. The resulting gain is somewhat accentuated by the fact that the best land is available for use—since speculative holding does not pay. With more available space city congestion is somewhat relieved and rents tend to be lower. If the wage earner saves something from his wages, he can lend or invest it with hope of a higher return because it is untaxed. At any rate he can secure such a higher return unless or until the inflow of capital and possibly new accumulations encouraged by the higher net interest reduce the return to the level realizable in the less favored territory. In case he desires to own his home, the greater cheapness of land will be frequently a net advantage to him of hundreds of dollars. With his larger income he can the sooner save a given amount for a home and with the lower price of land he need not save so much.

Professional economists sometimes fail to comprehend that any advantage is secured to the thrifty poor man anxious to earn enough to secure land for a farm, home or business, by the greater cheapness of land induced by the tax. What such economists say is that the lower salable value of the land induced by the tax is offset by the higher tax on it so that whatever the buyer gains on the one hand he loses on the other. So common is this objection among trained economists that it is hard for one to realize its utter superficiality. Even if the lower price of land is entirely offset by the higher tax on the land, we must not forget that this higher tax on the land displaces a tax on improvements. Not to have the tax on the improvements is, then, an absolute net gain to the buyer and improver of land whether he wants it for a home or for some other purpose. No one can deny it who admits that land value is determined by the capitalization of net rent and who follows his arithmetic. He may feel this result of a land-value tax to be lamentable but he can scarcely deny that it is a result.

Two further points are to be noted. We have temporarily put out of account the possible higher, because untaxed, net interest on capital in the territories taxing only land values, as a result of which the salable value of land, being capitalized at a higher rate, might fall in greater proportion than its net rent. For the moment we have also ignored the possible effect of such a high land-value tax in discouraging land speculation, increasing competition to get land used, and so lowering both the net rent of land and the salable value which depends on it. Can it possibly be claimed that the lower price of land, which is caused by the tax subtraction from its rent, by the further possible diminution of its rent because of discouraged land speculation and by the capitalization of this remaining rent at a higher interest rate and, along with all this, the removal of all taxes on improvements, does no more for the thrifty poor man who finally saves enough to buy a home than to balance the increased tax on the bare land and so leave him no better off?

If the arithmetic of the above argument is correct, it would seem that no tax on incomes, specific commodities or sales can possibly make the conditions of life so favorable for a poor man who is nevertheless thrifty and desirous of some day being an owner of land, as a tax on bare-land values. Few, if any, of these other taxes would completely avoid burdening him either directly or indirectly, and none of them would have *all* of the desirable consequences for him which land-value taxation would have.

Furthermore, the system of land-value taxation would make easier the economic rehabilitation of those whom bankruptcy has reduced to financial ruin or whose children, because of the business reverses suffered by their parents, must again start at the bottom of the business ladder.

It must be said, however, that the smaller the area in which land-value taxation is applied, the more ephemeral are its special benefits to the people of that area. Thus, if it should be applied in but a single city or county, any resulting benefits to the majority of the population (of such city or county) would too soon be largely neutralized by the inflow of population from the less-favored places outside and by the resulting increased competition for jobs and for land. It would perhaps indicate undue optimism to expect that notable apparent consequences would follow the gradual adoption of such a land-value-tax system here and there in cities or other local governing units.

Nevertheless, even some who are a bit doubtful of the merits of such a tax system might without inconsistency urge its adoption in a few places by way of experiment and in order that the growth and development of such places under its operation might be studied. Or, is the system demonstrably so terrible, on theoretical or *a priori* grounds, that we should strenuously resist its securing even a precarious foothold in our American life—if it has not already done so in the "graded tax system" of Pittsburgh and Scranton, Pennsylvania!

The "Confiscation" or "Vested Rights" Argument

I am not going to offend either the conservative supporter of the status quo by asserting that the private owner's claim to economic rent may properly be confiscated entirely or the enthusiastic single taxer by contending that it stands on the same basis as every other property right. After all, as a practical proposition, large political bodies, like large physical masses, can be got under motion only slowly, and so no general change can be brought about except by degrees. Is it not, therefore, academic and futile to dispute at great length the question whether, as a matter of abstract ethics, society has a "right" suddenly to substitute for our present taxation system, a system appropriating practically all the rental value of land? That question may, of course, be debated. But I fear that the debating of it here would cloud the real and practical issue with passion and so be worse than useless. The real question is rather whether society has a right, by gradual steps, to change its tax policy in the indicated direction, if and when the majority is convinced that the public welfare would be thus furthered.

While the argument that increased taxation of land values would violate vested rights may be effective propaganda against such taxation, it is probable that many of those who use this argument are far from being, in other respects, consistent supporters of vested rights. Thus, to illustrate, a local gas company is started with a cost for plant construction of $500,000. A reasonable net return might be $35,000 or 7%. But through lack of regulation, the company is enabled for some years to charge rates making $105,000 net or 21%. On the basis of this rather large return the stock of the company is in great demand and sells for $300 a share or at the rate of $1,500,000 for the whole concern. If the rates are now brought down by regulation, the salable value of stock bought in good faith by inno-

cent purchasers will be reduced to perhaps only ⅓ of what they paid for it. Will those who say that no increase of land-value taxation, however gradual, is permissible, though it greatly relieves capital and enterprise, also agree that, if innocent parties have in good faith purchased stock in an unregulated monopoly, then the public is forever morally estopped from regulation and must be willing to pay monopolistic rates for all future time? Who does not suspect, if he does not indeed know, that many sticklers for vested rights as against land-value taxation, are not only favorable to rate regulation in the circumstances above described, but even favor that economically unreasonable regulation which would make no allowance to the regulated companies, in this day of high prices and values, for the great depreciation of the dollar?

But let us turn our attention to the tariff. Suppose that, during a long period of Democratic control of Congress, the tariff is lowered and stays low and that, in consequence of the greater cheapness of certain raw materials a number of manufacturers build up an export trade of considerable proportions in products made of these materials. Then come Democratic defeat and revision of the tariff upwards. How many Republicans, conservative supporters of vested rights, would say that a moral obligation exists not to increase the tariff because of the injury which might follow to a business man in the described situation? Or, reversing our hypothesis as to parties, how many of Democratic persuasion, who favor tariff reduction, will admit that the long continuance of a high tariff, the fact that people have made their investments on the supposition of its continuance and the fact that to reduce it will lower the salable value of the property of people who have thus invested—how many will regard all this as conclusive against any tariff reduction, even a gradual one?

Whatever may be the reader's opinion about the desirability of prohibition, all of us must admit that its establishment lowered the salable value of the business property of some of the people. Surely it cannot be denied that here was an infringement of "vested rights." But the policy was adopted with fairly widespread support and with almost no reference to the bugaboo of "confiscation."

Those who favor regulation of monopoly prices, or who believe in tariff increases or decreases, or who were eager for prohibition, despite the effects of any or all of these changes in reducing the value of some people's property, and who oppose increased land-value taxation, will say of the last named: "Oh, that's different." And yet, *is* it utterly different? Do investors in all these other ventures invest at their peril and does the purchaser of land purchase it with the implied moral obligation on the part of society never to move, no matter how gradually, in the direction of relatively heavier taxes on land values? Might there be some excuse for a slightly different view, viz., that the purchasers of land have not bought it with any binding implied pledge on the part of society never to change its tax system, even by degrees, to the possible disadvantage of such purchasers, but merely with the practical certainty that no such change will, as things work themselves out in our political life, be made suddenly and without warning?[8]

[8] I once heard, in conversation with an agricultural economist of some reputation, an interesting comment on the proposition that the tax on land values might be increased gradually. The comment was to the effect that to increase the tax by degrees was like cutting

(Continued on page 385)

Is Speculation in Vacant Land Desirable?

After having discussed the arithmetical aspects of land-value taxation, let us turn to a very few of the more important specific objections made to the proposal. I have discussed most of these at some length elsewhere[9] and do not believe that the entire matter need be repeated here, especially as some of the objections are so seldom presented and others are almost pitifully untrue or beside the point or insignificant. A few of the more important objections, however, ought by all means to be examined carefully.

One of the points sometimes made by opponents of land-value taxation may be termed an attack on a kind of outpost, though perhaps not an altogether unimportant one, of the land-value-taxation philosophy. In answer to the argument that an increased tax on land would discourage speculative holding of land out of use, it is often said that such speculative holding is desirable and ought not to be prevented. This answer does not seem to me a convincing one, yet it contains a very small admixture of truth. Holding a piece of land out of use during a few years will sometimes save it for a later and better use, obviating the expense of building and tearing down again a structure less suited to the long-run potentialities of the land.

Thus, suppose a land speculator held vacant a piece of land near the center of a rapidly growing town. Conceivably some one might otherwise build a house on this lot and, a very few years later, the circumstances might call for a twelve or fifteen-story office building on the site. Meanwhile the house might not have earned enough to justify its having been built. To tear it down in order to make room for the skyscraper would be an expense that might have been avoided. To leave it up until it is old and no longer serviceable would keep the land from a use in which it would be of more service.

Yet there is clearly a loss to the community from the holding of land out of use. More remote and poorer land has to be used instead. In a city the speculative holding of lots forces builders sooner into the suburbs. As a result, streets, sewers and gas mains have to be extended farther from the center of the city; telephone and electric light wires have to be stretched over longer distances; transportation problems become more difficult of solution; store delivery service is made more expensive, and the expense to individuals of riding or walking longer distances to and from their work is increased.

(*Footnote 8 continued from page 284*)

off a dog's tail by degrees. Of course, any real thought at once reveals the fact that the analogy is false. To cut off a dog's tail in sections multiplies the animal's pain according to the number of times it is done, whereas to raise a tax on bare land by degrees *very greatly reduces* the loss to the landowner, even assuming that the removal of taxes on improvements does not really offset or more than offset his loss in regard to the land. For the salable value of the land is arrived at, as we have already seen, by capitalizing its prospective rent, and, in this process of capitalizing, the rent of the more remote future years is of negligible arithmetic significance. So a gradually rising tax which slightly diminishes net rents of the first few years and diminishes greatly only the rents of the remote future, lowers the present salable value of the taxed land and its salable value for the first few years by a comparatively small amount; whereas an immediate increase of the tax to the maximum lowers the present salable value of the land by a great deal. All this is not to deny, of course, that whatever advantages land-value taxation might bring are also delayed in their arrival by the attempt to postpone, for the benefit of present landowners, any rapid fall in land values. (It should not be necessary to elaborate on the arithmetic of this. It is simple enough to be understood by anyone who knows the process of finding the present value of a series of future incomes.)

[9] See Harry Gunnison Brown, *Economic Science and the Common Welfare*, 3rd edition, (Columbia, Mo. Lucas Bros., 1926), Part II, Ch. VI and *Taxation of Unearned Incomes*, 2nd edition (Lucas Bros., 1925), and various articles in the *Journal of Political Economy* in 1925–1928.

Losses such as these may actually be much greater where speculation is commonly thought of as not acute than where it is supposed to be rampant. The speculator in a rapidly growing town who soon sells out to users, even though at a high profit to himself, at least does not cause the incident waste, so far as his lots are concerned, to continue a very long time. But the owner of vacant lots in a slowly growing town who holds them for many years waiting for them to rise in price or, equally, to avoid selling at a loss, is to that extent responsible for the long continuance of waste and loss to others.

If, with all this economic loss to the community from the keeping of good and well-situated land out of use there may be also at times some avoidance of waste, the ideal method might be to penalize keeping the land out of use when such speculation causes a net waste and not to penalize such action when it avoids waste. But no legislature or administration could formulate any precise and satisfactory rule for determining when such balance of good exists.

Something might be gained if we could devise a system which would cause the gains and losses incident to land speculation to impinge on a single mind; and that, the mind of the person who has title to the land, is in a position to determine whether the land shall or shall not be yet used. If the gains from holding the land out of use until a later date accrue to a private speculator, whereas the economic losses therefrom fall on the community at large, then, even though these losses vastly exceed the gains, this fact will exert no slightest influence towards getting the land used and so terminating the losses.

But there is perhaps danger in assuming that the speculation in question is more intelligent than it really is. What about that large mass of owners of vacant lots who have property which they hold with a kind of vague hope that it may rise in price, who are unwilling to sell except at a price higher than available buyers will pay, no matter how great the economic waste to the community, and whose holding of the land certainly is no benefit, in the way of economy, to the community.

If, in general, vacant lots in cities were kept vacant until they could be used for banks, office buildings, and department stores, then the tearing down of less valuable structures would be avoided, although the waste of waiting through the years and having meanwhile to extend wires, delivery service, etc., longer distances might amount to a sum far exceeding the incident benefits. But what if the vacant lots are held vacant and builders of dwelling houses are driven farther out from the city's center, only that the lots may be sold after the lapse of 10 or 20 or 30 years to new residents who build there houses of the same general type as would have been built in the first place? All of us see lots remaining unused for years, even for decades, while new houses are built farther from the city's center, the unused lots, however, being developed, after more distant sections have been partly settled, for the building of houses similar to those farther out. We know that, after years have passed, the more centrally located areas finally come to have very few vacant lots, so that when the need for putting skyscrapers upon them does arise the ground is encumbered by buildings which must be torn down. It would be rash to assert, on the basis of the evidence, that land speculation, with the speculator comparatively untaxed and a loss from his holding the land idle falling heavily on

others, actually benefits the community or that it does not, on the average, cause a real and definite loss.

Economists sometimes present a theoretical argument intended to show that land speculation is really very little practiced. This argument runs to the effect that speculative holding of land is not on the whole profitable, and that people will not therefore engage in the practice. It is supposed that the landowner, even if he hopes for a rise in the value of his land, will not refuse to make use of this land or allow others to do so for a price, while he is waiting for the rise in value to come. He will, it is supposed, allow his land to be used because to do so is more profitable than not to do so.

The trouble is that much land which, if improved, would be well worth using, cannot be advantageously used unless it is improved. But who is to do the improving. It must be the speculating owners themselves, or tenants who are users of the land, or other owners who acquire it by purchase. Let us see, by considering each class of persons, why land may be held out of use although such holding is less profitable than use would be.

Among those who hold land out of use for a rise are some who have not the means to improve it, unless they sell part to raise the means for improving the rest, and this, if they anticipate a rise, they will not desire to do. Others among such owners expect, although doubtless often mistakenly, such rapid increase in the value of land, that they would rather purchase more of it than to improve what they have, hoping to make a higher return than by improving. Still others have not the energy or confidence to go ahead with improvements.

To say that people will not hold land out of use speculatively because such holding does not pay on the average, is just as reasonable as it would be to say that people will not engage in lotteries or in wagering money on roulette wheels because in the long run such gambling does not pay. Whatever the advantages, in economic reasoning, of positing an "economic man," it is unsafe to base conclusions on the supposition that every person is such an "economic man." Everyone who is not inwardly determined to believe the contrary knows that land speculation *is* practiced and practiced on a considerable scale.

What about the possibility of the speculatively-held land being improved by potential tenants with the owners' consent? Here the trouble lies in the fact that tenants cannot afford to make improvements except as they can secure long leases or other satisfactory guarantees against losing to the owners most of the benefits of the improvements. Moreover, speculating owners, who desire the privilege of selling their land without restricting encumbrances when a good chance comes, will not ordinarily consent to such long leases.

Construction by non-owners of the speculatively-held lots, who must buy them before improving them, may be further prevented by exaggerated notions of the speculative owners regarding their value. Speculative anticipations of owners who will not themselves improve their land, may cause them to refuse to sell except at prices so high as to make purchase by persons who would improve the land seem, for a long time, not worth while.

If owners of vacant land do not have the losses of the community from land speculation brought home to them as personal losses, if they are induced to hold land vacant because of exaggerated hopes, and if improvement by themselves, by potential tenants or by pos-

sible new owners is thus prevented, may it not be desirable to penalize the holding of land out of use to a greater extent than it is now penalized, to the end that a saner balance be established between used and unused land?

However, it may be noted that a person who believes speculative holding of land to be socially desirable, may still consistently support very heavy taxation of land values. But he would need to urge that only used land be taxed. Or, if he believed land speculation to be, on the whole, socially advantageous, but believed also that it is carried too far at times and should be somewhat discouraged, he might at the same time uphold very heavy taxation on rent actually received and lower taxation on the potential rent of valuable land held out of use.

Is the Principle of Taxation According to Ability Valid?

The idea back of the ability principle seems to be that the relative sums taken from rich and poor should be such as to impose "equal sacrifice" upon them, per individual. If it takes $1,000 to live, a person with an income of $100,000 has as much *ability* to pay $99,000 as a person with an income of $1001 has to pay $1. But this is not what ability theorists seem to have in mind. Their idea apparently is that a tax of $10,000, for example, from the richer person may, in the average of cases, mean as much "sacrifice" to him as does a contribution of $1 from his poorer fellow citizen. Then these theorists would wish, in case the latter citizen were taxed 1/10 of 1% on his annual income, to tax the former 10%.

One may well inquire where a logical defense is to be found for this principle. Surely it does not lie in the idea of maximizing utility? To do this would involve carrying the tax discrimination against the rich very much further. Suppose we have already taxed the richer man $10,000, and still more funds are needed for governmental purposes. Clearly it will cause less sacrifice, less loss of utility, to take the 10,001st dollar from the same individual than to take a dollar from the other. So with every additional dollar (assuming the individuals to be similar in their needs and wants, as they would tend to be except for differences in habituation and utterly incalculable differences in inborn traits) up to the point where the remaining incomes are equal. In short, it is a fair question whether one who favors the "ability theory" of taxation on the ground that it involves *less sacrifice* or burden than some other system can logically stop with the proposal to establish *equal sacrifice*. Must he not insist on a basis of *least* sacrifice? Must he not also, if his theory of public policy is so based on maximizing utilities and minimizing disutilities, necessarily end by supporting the whole theory of communism? Logically, and in all consistency, where else can he end?

But, of course, he will not want to end there and he will demur to the contention that he must. In the long run, he may say, such a communistic system, whether applied in general or applied only to taxation, would so penalize efficiency and thrift as to *reduce the productiveness of industry* and decrease the total of goods which all may enjoy. To maximize utility for the time being would not, therefore, he may say, maximize utility *in the long run* and would not be desirable public policy.

Probably so. In other words further effects are to be considered besides the possible temporary maximizing of utility. But on what basis is it to be argued, then, that we are to levy taxes in such a

way as to impose *equal* (as distinct from *least*) sacrifice? Is the advocacy of such a policy the result of a secretly felt agreement with the communistic ideal, coupled with a sense of horror at the notion of the consummation of communism? Such a complex of feelings might result in the advocacy of a certain amount of communism in our tax system yet not enough of it to change very greatly the general nature of our economic institutions.

Let it be understood that I am not attempting here to take an extreme or dogmatic position. I am not asserting either that the comparative utility at the margin of the incomes of different persons or classes should or should not have any bearing on the relative amounts of their taxes. But I am contending that there is no single principle on which the so-called "ability theory" can be defended except a principle which, if it is to be followed, must in all consistency carry us to communism. And if it be said that this principle is not the only one to be considered but that other principles are of great importance to justice and wisdom in taxation, then the question immediately arises whether these other relevant principles may not support a system of taxation which is not at all in proportion to ability.

There are at least two classes of persons who cannot with logic and consistency support taxation according to "ability" in preference to taxation of the rental value of land, although many of both classes actually do so. First, there are those who favor taxation on the basis of "ability" because they sympathize with the masses and desire that the "common man" shall have the best possible chance for attaining high net current income and a modicum of property. As hinted earlier in this article, a tax on the rental value of land is not only really less burdensome to the masses than present taxes but even than a highly progressive tax on incomes in general or on all property. A tax on the rental value of land is certainly not shifted to laborers in the form of reduced wages. The person who, though poor, is hard-working and thrifty, seeking thus to rise economically above the ranks of those who are merely workers by becoming an owner of property, finds that he can secure a larger interest (because it is untaxed) on his savings. Furthermore, the land will cost him enough less under the land-value tax system fully to make up or more than make up for the tax on it. Whether or not there are classes that would bear an extra burden from a land-value tax, which may properly discredit it as a revenue raising device, is not the present question. The question here is whether those persons who profess adherence to the so-called ability theory of taxation because they want to make conditions the best possible for the masses and who prefer such taxation to land-value taxation for that reason, do not simply lack understanding of the nature of the consequences to which land-value taxation leads.

The other class of opponents of land-value taxation whose position is an illogical and inconsistent one is that class which professes itself opposed to communism—shall we say to Bolshevism?—and which thinks itself further away from such "isms" in supporting progressive taxation of all incomes than in supporting heavier taxes on land values. I am not here arguing that taxation based on the idea of maximizing utility is "wrong" or even that communism or "Bolshevism" is necessarily and inevitably "wrong" but merely that such taxation bears fundamentally a closer resemblance to communism than does

heavier taxation of community-produced land values.

For land-value taxation takes for public purposes only what is almost altogether community-produced value, and, so far as it is concerned (i. e., unless or in so far as it is supplemented by other taxes), the more efficient laborer, professional man or executive receives higher income than the less efficient one by the entire amount of his superior efficiency with no tax subtraction. Any tax on his land value does not take more from him by virtue of his superior efficiency but only by virtue of a superior *location* which is made superior almost solely by the community rather than by himself. Likewise the thrifty person, who is trying to accumulate a competence and who is thus responsible for adding to the capital equipment of society, is allowed to receive all the benefit of his thrift in the form of return or interest on the capital saved and with no tax deduction. In short, land-value taxation, whatever may be its evils, distinctly does *not* attempt to reduce the efficient to the level of the inefficient or the thrifty to the level of the thriftless, while taxation according to so-called ability does, in at least some degree, exactly that.

Would Bare-Land-Value Taxation Burden the Farmers?

The idea that removing taxes from improvements and concentrating them on the economic rent of the bare land would be an especial burden upon owners of farms as compared with owners of land in cities seems to be widespread. I am strongly of the opinion that this idea is entirely incorrect. Indeed, I rather suspect it may be the opposite of the truth. Certainly there can be no doubt that a good many farmers are now paying annually in taxes much more than the economic rent of their bare land and that if the maximum tax they were asked to pay should become *even 100%* of their economic rent, their taxes would be *greatly reduced* below what they now pay.

I believe that the important requirement here is for us to get clearly in mind just what economic rent is. It is the amount which a person could afford to pay, and which the competition of others would force him to pay, for the use of a given piece of land, in excess of what he would pay for the use of its improvements. Or, it is what the land yields to the person who owns and works it, in excess of return on improvements and return on the efficiency of his work. It is something which he derives from the bare land, as such, and its situation. It is not the extra sum which an efficient manager gets above what an inefficient one would get. That is return for efficient management, i. e., pay for a particular kind of labor. Economic rent is a *surplus over this* due to the land. Furthermore, the fertility of agricultural land is constantly being exhausted and having to be restored. Constant care in crop rotation, treatment with manure or artificial fertilizer, and sometimes treatment with lime, are essential to its continued productiveness. Fertility then is to be reckoned, in large part, as capital.[10]

But the tax on bare-land value is supposed and intended, by its adherents, *not* to be a tax on improvements. The present system is indicted because it fines a man for building or for painting a house or for planting an orchard. It would clearly not be consistent for those who oppose our present tax system

[10] For a more precise theoretical formulation of the line of distinction, see Harry Gunnison Brown, *Economic Science and the Common Welfare*, Part II, footnote beginning on page 253.

and who would substitute a tax on bare-land values, to desire to tax that part of a farm's fertility value which is restored or even maintained by the farmer's effort and investment. Logically, then, the taxes on the economic rent of land would have to be so levied that the farmer who improved or who merely maintained the fertility value of his land would be asked to pay no higher tax than the farmer who, with an equally good situation, allowed the fertility of his farm to run down.

But surely those persons are really inconsistent who, in the same breath, contend that farmers in general cannot now get any reasonable return for their effort and also that land-value taxation would burden them. As we have seen, a tax on economic rent, as such, takes only from the *surplus* above wages and managerial productiveness and *above* interest on worth-while improvements. If it takes more it is *not a mere tax on rent*, but something else. Now to say that such a tax on the rental value of a farmer's land would be a heavy burden is to say that the farmer does receive a considerable surplus above remuneration for his effort and *above* interest on all his improvements including fertility.

If farmers in general are now doing so poorly as is commonly stated by their spokesmen, then most of them must be receiving either no economic rent at all or, at best, very little. If so, a tax only on economic rent would be either no tax at all upon them or a very light tax. It hardly seems likely that in most cases such a bare-land-rent tax could be as burdensome as the tax now levied on the assessed value of the entire property. It is evident that the taxes now being paid by a great many farmers much exceed their entire economic rent.

At any rate, attempts which have been made in economic literature to show that the "single tax" would burden the farmer but which have been based on the supposition that all fertility value—and sometimes even the value of established fruit orchards—is to be classed as land value, certainly are of little evidential significance.

In passing, the reader might be asked to recall the fact emphasized in a previous section, that to tax bare-land values operates to make the sale price of land low and to make easier the road from tenancy to ownership.

Conclusion

And now, for those who, though they may be doubtful of the virtues of the land taxation policy with tax exemption of all improvements, yet do not regard any slightest step in that direction as mortal sin, I venture one parting suggestion. There might be some advantage in allowing such a system to get a fair foothold in the United States, as a matter of experiment. If a dozen or score of cities of consequence were to move by degrees in that direction, the result would hardly be calamitous. (No economic earthquake has destroyed Pittsburgh!) And we might so have a chance, by watching their growth and development, to determine whether we wished to extend the system further.

Some would willingly, if they could, apply the system everywhere without waiting for such a trial, being confident from general reasoning and from apparently satisfactory results in Australia and elsewhere that only good could come. Others would not consent, under any circumstances, to even a brief and narrowly localized trial in the United States of a system they think so wholly bad. Is there, also, a third group, of which, perchance, the reader is one, who are

not quite certain either way, but who are willing to support a trial of the scheme, here and there, as a bit of worth-while adventurous exploration? To leave bare-land value untaxed makes land prices high. Home and farm ownership are therefore difficult save through the assumption of heavy mortgage indebtedness which, in every period of unemployment in the cities or of price recession of farm products, leads to bankruptcies, foreclosures and distress.

A STUDY OF UTILITY FINANCIAL STRUCTURES: CAPITAL INVESTMENTS AND SOURCES OF CAPITAL[1]

By A. H. WINAKOR

THE manner of obtaining capital for an enterprise is dependent primarily upon two factors: (1) the nature and the distribution of the real capital, and (2) the productivity of the capital.[2] The following study shows to a surprising degree that not only is there a representative type of financial structure for property investments of public utility companies, but also there are no consistent or outstanding differences from this typical plan for companies in different sections of the country, of different sizes, etc. A similar statement cannot, however, be made for the typical structure of these enterprises in so far as their sources of capital are concerned. Very great and significant differences exist among them with respect to the manner of securing their capital. In other words, in organizing a utility enterprise, the promoters can normally exercise little discretion as to the proportion of the fixed capital to working assets and other assets, but they can exercise considerable discretion as to the manner of securing and the sources of their capital. The manner of securing capital will depend very largely upon the anticipated productivity thereof, but no attempt will be made here to discuss this phase of finance.[3] This article will be devoted to an analysis of the manner in which public utility capital is invested, and to the different sources from which this capital has been obtained.

The financial structures of some 200 public utility companies have been analyzed for the basis of this study, and their statements for the years 1915 to 1924, inclusive, have been uniformly standardized as indicated in Table I.

In the standardization of these balance sheets the fixed assets have been retained at their gross value. Because so many of the published statements lumped reserves for depreciation with other reserves and surplus, it was decided to show the fixed assets at their gross value, and to show surplus and reserves as one item on the liability side of the statements. In order to present a picture of a utility enterprise as it normally exists, investments were likewise retained. However, in the case of holding companies, the investments compose the fixed assets.[4] All items receivable within the current accounting year were classified as current assets, as were likewise inventories of fuel, and receivables from affiliated companies where they were "cur-

[1] Data based on *Bulletins No. 18 and 20*, Property Investments in Public Utility Companies, and Sources of Public Utility Capital, Bureau of Business Research, University of Illinois.

[2] Capital is here used as synonymous with assets. Thus total capital corresponds to the total assets of the standardized balance sheet presented below. This term has been used in order to avoid confusion arising from accounting terminology, and also to distinguish clearly total capital (or total assets) from operating assets which form the basis of the classification of companies by size.

[3] See "A Study of Utility Financial Structures: Revenue Production Ratios," by A. E. Patton and O. Gressens, 3 *The Journal of Land & Public Utility Economics* 32–47 (February, 1927), and *Bulletin No. 10*, Bureau of Business Research, University of Illinois.

[4] The study includes holding companies, gas and electric operating companies, and traction companies, but the data are so analyzed as to show the structure of each type independently.

TABLE I. FORM OF STANDARDIZED BALANCE SHEET USED IN STUDY OF 200 PUBLIC UTILITY COMPANIES.

PROPERTY INVESTMENTS		SOURCES OF CAPITAL		
Fixed Assets	XX	Long-Term Debt		XX
Investments	XX	Current Liabilities		XX
Current Assets	XX	Capital Stock:		
Other Assets	XX	Preferred	XX	
		Common	XX	
		Surplus and Reserves		XX
Total Capital	XXX	Total Liabilities		XXX

rent." All other assets were classified as other assets, except that sinking funds were deducted from long-term debts.

In the classification of the liabilities anything not maturing within a year was called long-term debts. Current debts were classified as current liabilities. Unadjusted credits, however, were included with the net worth.

For each company in the sample ratios were computed for each of the items in the standard balance sheets, using the total capital as the base of each ratio. The numerous ratios of each kind were then cast into frequency distributions which show the tendency, if any, of the ratios to concentrate about certain values. Since the purpose of the study is to determine the typical financial structure, the mode has been selected as the representative average. Average ratios have been calculated by fitting frequency curves to the data, or frequency distribution, for each ratio.

In this study ratios will be analyzed (1) for the group of utilities[5] as a whole, (2) according to geographical location of the companies, (3) according to sizes of the companies, (4) according to types of companies, and (5) under changing general business conditions. By this method, an attempt will be made to determine whether any "normal" or representative ratios typify the property investments and sources of capital of public utility companies.[6]

The two general groups of representative ratios are summarized respectively in Tables II and III. The frequency distribution of the separate ratios may be seen on Charts I, II, III, IV, V and VI, based upon frequency tables most of which are omitted.

I. Representative Ratios of Property Investments

The Ratio of Fixed Capital to Total Capital. The first group of ratios indicate the various proportions in which the total capital is distributed among the various kinds of capital. In utility industries by far the most important is the fixed capital investments. From the nature of the services performed by utilities these fixed investments domi-

[5] Telephone companies, water companies, and municipally owned utilities have been excluded. The telephone industry was omitted because the Bell System, controlled by the American Telephone and Telegraph Company, dominates the field, and a study of the financial structure of the Bell System is virtually a study of the telephone industry. Water companies have been excluded because of the predominance of municipal ownership among them, and municipally owned utilities have been excluded because ordinarily the attempt to earn a return upon the capital invested in them is subordinate.

[6] The "normal" ratio as here used is a representative ratio, i. e., it is the ratio of most frequent occurrence in the companies analyzed. It is the value about which the ratios of the greatest number of companies tend to concentrate.

nate, only a small portion of working assets being necessary to supply and maintain production.

Noting first the ratio of fixed capital to total capital for the entire group of companies (Table II and Chart I) it is evident that the majority of the companies (65%) have ratios between .87 and .99, and the typical utility enterprise has 93.1% of its total capital in the form of fixed capital.

Considering the ratios according to the geographical location of the companies,[7] it was found (Table II) that companies in the East with their greater productivity of capital have a relatively smaller portion of their capital invested in fixed properties as indicated by the typical ratio of .907. In the West, where many of the large hydro-electric plants are located and where the capital turnover is slow, the fixed investments constitute .948 of the total capital.

A classification on the basis of the total operating assets showed that companies with 5–9 millions of operating assets have proportionately more fixed capital (.956) than have the larger companies. For companies above this size, no significant variations appear.

Not only do traction companies have greater fixed investments than gas and electric companies, but also greater uniformity in policies appears from the data for traction companies. Seventy-one per cent. of the traction companies analyzed have 80% or more of their capital tied up in fixed capital, whereas only 37% of the gas and electric companies have ratios above .80. The typical ratio for gas and electric companies (.923) is smaller than that for traction companies, with holding companies in an intermediate position (Table II).

It is very commonly believed that the financial structure of utilities is stable and not subject to change. But an analysis of the ratios shows that constant change, albeit a slow one, is taking place. The proportion of total capital invested in fixed capital appears to be decreasing steadily. This tendency is indicated by the ratios in Table II, but is more clearly borne out by the following figures. From 1917 to 1924 the per-

[7] For the basis of this division and states included in the geographical sections, see *Bulletin No. 9*, "The Current Ratio," Bureau of Business Research, University of Illinois.

TABLE II. REPRESENTATIVE RATIOS SHOWING PROPORTIONATE PROPERTY INVESTMENTS OF PUBLIC UTILITIES FOR THE ENTIRE INDUSTRY, ACCORDING TO THE GEOGRAPHICAL LOCATION OF THE COMPANIES, SIZE OF THE COMPANIES, OPERATIVE FUNCTION OF THE COMPANIES AND FOR SELECTED YEARS

Ratio	All Public Utility Companies	Ratios According to Geographical Location				Ratios According to Size as Measured by Total Operating Assets			Ratios According to Type of Operative Function			Ratios for Selected Years			
		East	Middle West	South	West	5–9 Millions	10–49 Millions	50 Millions and Over	Gas and Electric	Traction	Holding	1917	1919	1921	1924
Fixed Capital to Total Capital.	.931	.907	.944	.930	.948	.956	.941	.945	.923	.948	.944	.944	.945	.941	.927
Investments to Total Capital.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Current Assets to Total Capital.	.039	.070	.032	.035	.030	.019	.034	.035	.052	.028	.....	.032	.031	.034	.049
Other Assets to Total Capital.	.011	.009	.009	.025	.014	.009	.010	.010	.010	.009	.009	.009	.009	.009	.010
Total Capital.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

centage of companies having 90% or more of their capital invested in plants fell from 58% to 42%. The steadiness of this movement is borne out by the figures of 58%, 53%, 46%, and 42% for 1917, 1919, 1921, and 1924 respectively for companies with ratios between .90 and 1.00.

Representative Ratios of Investments to Total Capital. The investments, as here classified, are those found in the statements of companies which are primarily operating companies, since investments of holding companies are treated as fixed capital. A picture of the histogram based upon the actual frequencies of these ratios is given in Chart I. Because of the nature of the data and the extreme skewness of the histogram, no frequency curve has been fitted and no reliable representative ratio can be stated.

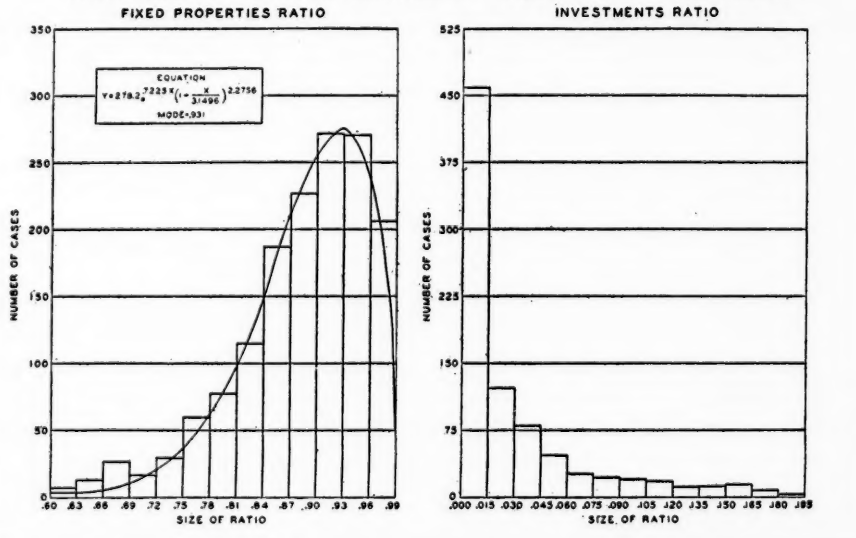
Nevertheless, the fact that 83% of the companies had less than .060 of their total capital tied up in investments is significant in that it conclusively shows the tendency for investments to remain small for the typical utility operating company. And 54% of the cases have a ratio of investments to total capital of .015 or less. The conclusion may be drawn that the industry as a whole has less than 1½% of its capital in investments.

The general nature of the data did not significantly differ from the above when analyzed in the detailed classifications. Eastern companies showed a tendency to carry larger investments, as did likewise the smaller ones.

Representative Ratios of Current Assets to Total Capital. The working assets or the current assets in the public utility industry habitually constitute a small portion of the capital. This is characteristic of the industry with its very slow turnover of capital, the steadiness of rev-

CHART I

HISTOGRAMS AND FREQUENCY CURVES OF RATIOS OF FIXED PROPERTIES AND INVESTMENTS TO TOTAL CAPITAL OF PUBLIC UTILITY COMPANIES



enues, and the lack of large inventories, goods in process, and receivables. Furthermore, it is accentuated by the failure of utility enterprises to "accrue" their revenue, i. e., the use of practically a "cash basis" of accounting for revenues. However, in spite of the smallness of the item, current assets furnish the dynamic part of property investments of utilities; it is the only item which is subject to very considerable fluctuations. The variations in this ratio are more than 100% for the typical companies as measured by the modal average.

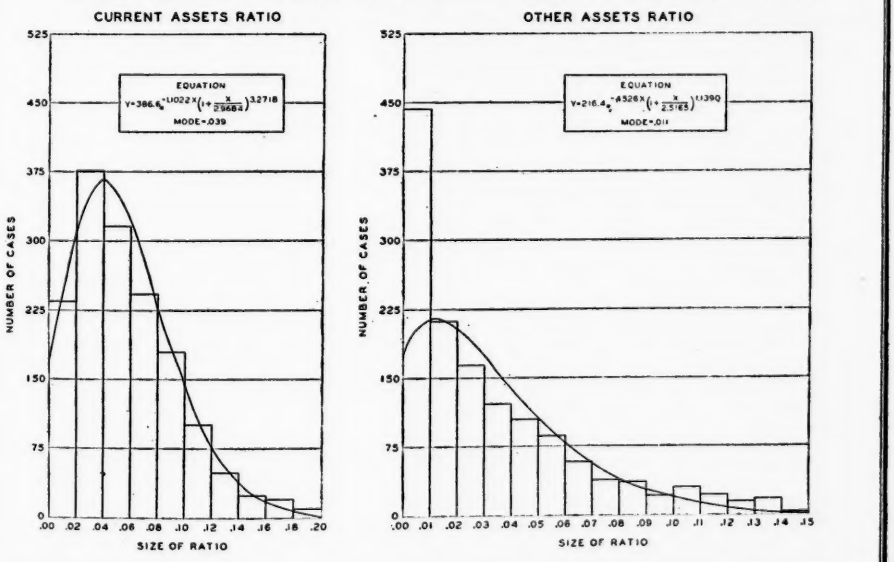
The histogram and frequency curve for this ratio (Chart II) shows that 87% of the companies have less than .10 of their total capital invested in current assets, and the calculated average is .039. The very considerable variations in this ratio are shown by the typical ratio of .070 for eastern companies (Table II), compared to .030 for western companies. The fact that the ratio for eastern companies is more than twice that in the West indicates a more rapid turnover of capital in the East, and hence a need for greater current assets to maintain production. Another very striking difference shown by the ratios presented in Table II is that companies with 5–9 millions of operating assets have proportionately much smaller current assets (.019) than the larger ones (.035).

Traction companies with their tremendous investments in fixed rolling stock and slow turnover of capital have only .028 of their funds in liquid working assets, as compared to .052 for gas and electric utilities. In the case of holding companies, the frequency distribution was irregular, indicating no typical ratio or value about which the ratios concentrated.

Not only does considerable variation exist in the proportion of working assets

CHART II

HISTOGRAMS AND FREQUENCY CURVES OF RATIOS OF CURRENT ASSETS AND OTHER ASSETS TO TOTAL CAPITAL OF PUBLIC UTILITY COMPANIES



for different sizes, types, and location of companies, but it changes from time to time. It is almost impossible to get seasonal or monthly changes in this ratio because published statements are lacking. But considerable change also occurs from year to year, as indicated by the typical ratios of .032, .031, .034, and .049 for 1917, 1919, 1921, and 1924. In the case of the current assets, the trend is just opposite to that of the fixed assets. Over the period of years the proportion of total capital in the form of working assets has increased slowly but steadily.

Representative Ratios of Other Assets to Total Capital. Under the heading of other assets have been put items of the nature of insurance, bond discount, prepaid interest, organization expense. Thus, the other assets do not truly represent "earning assets" and the smaller the proportion of capital so invested, the better off the utility will ordinarily be.

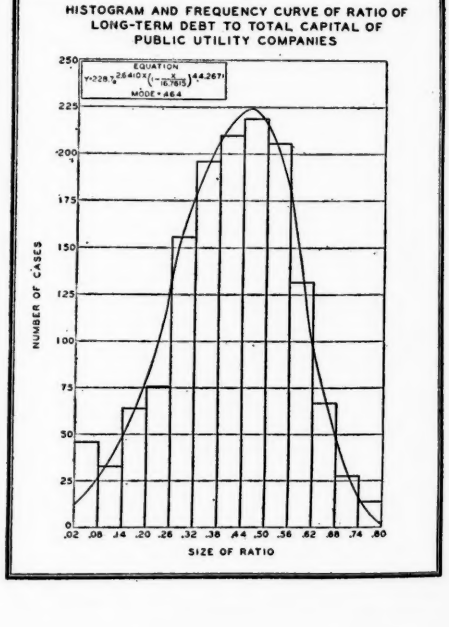
From the histogram and frequency curve in Chart II it will be seen that ¾ (76%) of the companies have other assets constituting less than .050 of their total capital. The representative ratio is .011. Few important variations exist for this ratio (Table II). The most striking differences are those among geographical groups of companies. The typical ratio of other assets to total capital of eastern and middle western companies is only about ⅔ that of western companies and between ⅓ and ½ that of southern companies.

II. The Sources of Public Utility Capital

Thus far the ratios analyzed have dealt with the "composition" of the capital of public utility companies; the proportions of the various kinds of capital as they exist in different kinds and sizes of companies, different sections of the country, and at different periods. In the remainder of this study, analysis is made of the sources or ownership of capital, and what type of financing is most commonly used. As in the foregoing paragraphs, ratios will be used, wherever possible, to show the sources and ownership of this capital.

Representative Ratios of Long-Term Debt to Total Capital. The utility industry, largely because of the regularity of its net earnings, has been a heavy borrower of capital on long-term conditions. More and more this is assuming the status of a permanent debt to be refunded rather than to be retired. Expansion of utilities has on the whole been too rapid to be financed satisfactorily only through reinvestment of earnings. Consequently, in many cases, new capital has been constantly added, with a tendency to maintain a balance between "ownership" capital and "creditors" capital.

The distribution of the ratios of long-term debt to total capital of the 200 companies may be observed in Chart III.



The representative ratio as determined for these data shows that .464 of the capital for the utility industry is furnished by creditors payable over a long period of years. Or viewing it from another angle, the utilities must pay fixed charges on almost half of their capital.

The tabulation of the ratios in Table II shows the very significant variations in long-term debts. Although both the East and South have ratios of .484, the ratio for the eastern companies is not very representative of its distribution, whereas that for the South is highly representative. Outstanding in the differences is the fact that the companies in the West borrow only .401 of their total capital at a fixed rate of interest. In other words, the companies in the West with their very low net earnings on total capital, neither can afford to, nor do they, borrow as much capital on fixed interest as the companies in other sections of the country.[8]

Apparently the proportion of long-term credit to total capital increases directly with the amount of the total operating assets of the companies (Table III). With the exception of a few of the hydro-electric utilities, the larger companies, located in the industrial centers, have steadier and more reliable demands for service and a more even flow of earnings. Thus it does not seem a reflection upon the type of financing to find companies with more than 50 millions of operating assets having a ratio of .530, while companies with 5–9 millions of operating assets only borrow .407 of their capital on long-term credit, as indicated by the representative ratio.

The impairment of the credit position of traction companies in recent years is reflected in the low typical ratio of long-term debt to total capital of .420. On the other hand, gas and electric utilities, which as a whole have enjoyed great prosperity of late, are acquiring some-

[8] For a discussion of the relation of net earnings to total capital of utilities, see *Bulletin No. 15*, Bureau of Business Research, University of Illinois.

TABLE III. REPRESENTATIVE RATIOS SHOWING THE PROPORTIONATE SOURCES OF CAPITAL OF PUBLIC UTILITIES FOR THE ENTIRE INDUSTRY, ACCORDING TO THE GEOGRAPHICAL LOCATION OF THE COMPANIES, SIZE OF THE COMPANIES, OPERATIVE FUNCTION OF THE COMPANIES, AND FOR SELECTED YEARS

Ratio	All Public Utility Companies	Ratios According to Geographical Location				Ratios According to Size as Measured by Total Operating Assets			Ratios According to Type of Operative Function			Ratios for Selected Years			
		East	Middle West	South	West	5–9 Millions	10–49 Millions	50 Millions and Over	Gas and Electric	Traction	Holding	1917	1919	1921	1924
Long-Term Debt to Total Capital	.464	.484	.469	.484	.401	.407	.475	.530	.508	.420	.473	.439	.478	.495	.480
Current Liabilities to Total Capital	.029	.033	.033	.034	.028	.028	.032	.036	.035	.031	.026	.032	.048	.033	.033
Capital Stock to Total Capital	.433	.413	.445	.452	.519	.515	.442	.354	.405	.472	.452	.482	.427	.421	.410
Surplus and Reserves to Total Capital	.074	.070	.053	.030	.052	.050	.051	.080	.052	.077	.049	.047	.047	.051	.077
Total Liabilities	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Preferred Stock to Total Capital	.154	.171	.185	.150	.139	.221	.199	.119	.141	.156	.....	.....	.....	.....	.....
Common Stock to Total Capital	.279	.242	.260	.302	.380	.294	.243	.235	.264	.316	.247	.....	.....	.....	.....

what more than half of their funds (.508) through long-term obligations.

From 1917 to 1921 the long-term debt to total capital ratio increased from .439 to .495, and then declined to .480 by 1924. These opposite tendencies of the ratio reflect the changing financial situation of the industry. In the earlier years many utilities were suffering declining net earnings, and were forced to resort to bond issues in order to expand. A reaction set in after 1921 bringing the ratio down to .480 in 1924 when stockholders' capital grew more rapidly than creditors' capital.

Representative Ratios of Current Liabilities to Total Capital. The nature of these industries is likewise reflected in the current liabilities of the ordinary utility company. The relatively small current purchases of fuels, oils, supplies, accruals of wages, interest, do not constitute a large part of the liabilities. Nor could they very well in view of the small current assets of the industry.

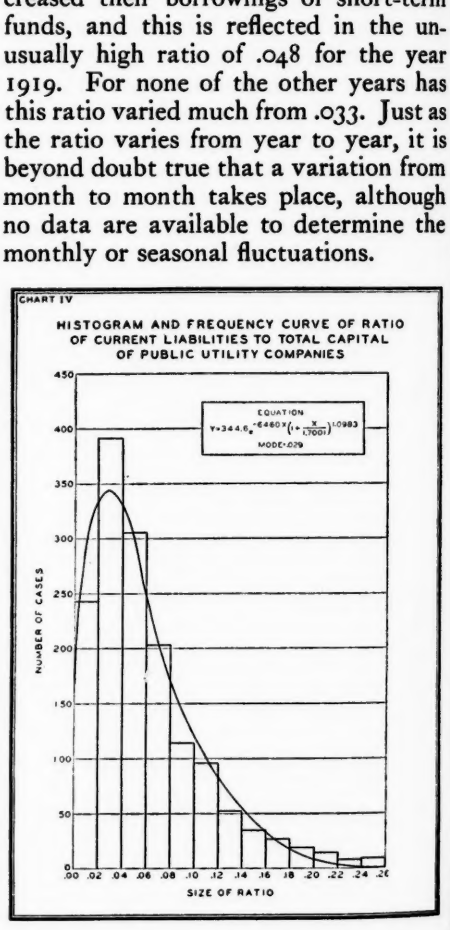
From the histogram and curve of this ratio (Chart IV) a very heavy grouping of the cases in the lower ratio groups will be noted. In general, for all utility companies in this study only 2.9% of the capital was obtained by the use of short-term obligations.

Moreover, no significant differences appear from ratios for companies in different sections of the country (Table III). In the West, where the companies borrow least on long-term debts, they also borrow least on short-term credits, as is indicated by the representative ratio of .028.

A significant fact in the use of creditor capital is that the larger companies which use proportionately more long-term capital likewise have a larger proportion of short-term capital. In other words, not only do the larger enterprises carry heavier burdens of fixed capital charges, but also heavier current liabilities (Table III).

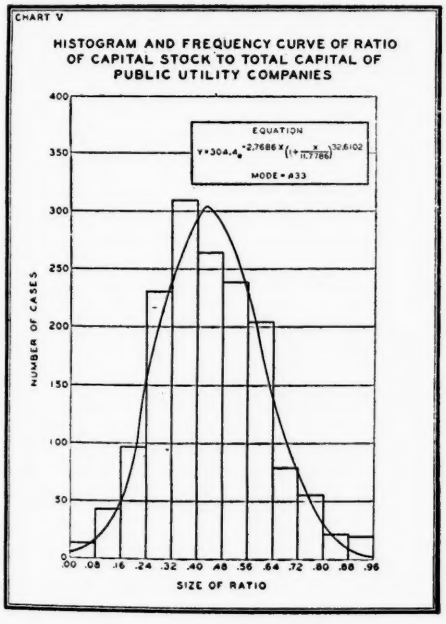
Analysis according to types of companies shows that holding companies use somewhat less short-term capital than do other types of companies. The ratio for holding companies is .026. The ratios for the selected years (Table III) show the very considerable variations which may take place in current liabilities in a short time. Under the stress of declining earnings and expanding demands for capital which existed during and after the war many utilities increased their borrowings of short-term funds, and this is reflected in the unusually high ratio of .048 for the year 1919. For none of the other years has this ratio varied much from .033. Just as the ratio varies from year to year, it is beyond doubt true that a variation from month to month takes place, although no data are available to determine the monthly or seasonal fluctuations.

CHART IV



Representative Ratios of Capital Stock to Total Capital. The stockholders' capital has been divided into the capital stock and the surplus and reserves. It represents the stockholders' equity—the buffer of protection for the short-term and long-term creditors. As it increases in relative amount, other things being equal, the protection afforded creditors increases. As it decreases in amount, their asset protection decreases, with the possibility of a greater net return to the stockholders. Moreover, possibilities of greater losses appear as the equity decreases. In this and the following ratios, the buffer of protection for creditors will be analyzed to determine the different types of financing employed by utilities, and the representative types of financing the equity. The stockholders' capital will also be separated into preferred stock and common stock.

Stockholders' securities account for 43.3% of the total capital of the utilities in this study (Table IV and Chart V).



This is divided between preferred and common stock in the proportion of .154 to .279. If, as is often true, the common stockholders have sole voting power, 14% of the total capital may thus control the typical utility enterprise.

TABLE IV. OBSERVED AND GRADUATED FREQUENCIES OF CAPITAL STOCK TO TOTAL CAPITAL RATIO FOR THE PUBLIC UTILITY INDUSTRY

Class Interval	Observed Frequencies	Graduated Frequencies
.00–.079	13	4.7
.08–.059	43	26.1
.16–.239	97	84.6
.24–.319	231	178.9
.32–.399	310	268.8
.40–.479	264	304.4
.48–.559	239	272.4
.56–.639	204	199.4
.64–.719	79	123.0
.72–.799	56	65.3
.80–.879	22	30.4
.88–.959	20	12.6
.96	0	4.7

Considering the companies by geographical groupings, the old well-established utilities in the East with their high productivity of capital and stable return have the smallest representative ratio (.413) of capital stock to total capital (Table III). The western companies, at the other extreme, obtain more than half of their capital from stock issues. This preponderance of stockholders' capital in the western companies is to be expected in view of the fact that these enterprises are newer and consist in many cases of hydro-electric utilities with their greater risks of construction, revenues, and financing.

A similar divergence in financing practices is also found by analyzing the proportions of capital secured through common and preferred stocks. In the East the representative common stock to total capital ratio is .242, and in the West .380, while the ratios of the other sections lie between these extremes. Furthermore, it is of interest that the eastern

and middle western companies use somewhat more preferred stock than is used in the South and West, and this in part offsets the greater use of common stock in the latter districts.

Likewise, as the size of the enterprise increases, the stock margin decreases in proportion to creditors' capital (Table III). Roughly, the group of smaller companies obtain ½ of their capital from permanent stock obligations, whereas the largest companies get only ⅓ from stock issues. Furthermore, as the size of the companies *decreases*, the tendency is for financing policies to become less uniform, as indicated by a wider scattering of the individual ratios. Not only does the ratio of capital stock to total capital decrease as the size of company increases, but the common stock ratio also decreases (Table III). However, as the size of company increases, the contingent charge capital, i. e., the preferred stock, declines more rapidly than the residual common stock equity.[9] For example, in the large companies, the tendency is to eliminate the contingent charge capital, and finance very largely with bonds and common stocks. Thus, for companies with 50 millions or more operating assets, only 11.9% of the capital is supplied by preferred stockholders.

The ratios for capital stock given in Table III show a steady downward movement from 1917 to 1924 which was very rapid during the war period, and quite slow in the years since then. The rapid decline from 1917 to 1919 is attributable to the use of bonds to the exclusion of stocks during these years, owing to high capital costs and abnormal conditions in the utility industries. This decline in the proportion of capital stock has been largely offset by increases in surplus during the last few years.[10]

[9] As will be shown later, the item of surplus is small, and does not change the validity of these statements.

Representative Ratios of Surplus and Reserves to Total Capital. The utility companies included in this survey on the whole have been unable to build up large items of surplus. This is attributable in large measure to regulation of the industries, to the newness of the industries, and to the type of financing used. As a result, until the last few years, expansion has not to any considerable extent come through reinvested earnings, which is reflected in a low representative ratio (.074) of surplus and reserves to total capital (Table V and Chart VI). However, a goodly number of the observed cases have ratios substantially higher than this, and on the other hand 5% of the observed cases show a deficit.

TABLE V. OBSERVED AND GRADUATED FREQUENCIES OF SURPLUS AND RESERVES TO TOTAL CAPITAL RATIOS FOR THE PUBLIC UTILITY INDUSTRY

Class Interval	Observed Frequencies	Graduated Frequencies
(—.209)-(—.18)	9	.1
(—.179)-(—.15)	9	.3
(—.149)-(—.12)	9	1.5
(—.119)-(—.09)	4	5.5
(—.089)-(—.06)	9	16.8
(—.059)-(—.03)	14	42.3
(—.029)-(—.00)	22	84.4
.00-.029	238	136.2
.03-.059	309	181.3
.06-.089	231	204.5
.09-.119	182	201.1
.12-.149	151	177.1
.15-.179	93	143.0
.18-.209	62	108.1
.21-.239	53	77.6
.24-.269	37	53.8
.27-.299	33	36.3
.30-.329	21	24.0
.33-.359	17	15.7
.36-.389	18	10.2
.39-.419	9	6.6
.42-.449	12	4.2
.45-.479	0	2.7

In the East where the companies are older and have gradually reinvested large amounts of capital over a number

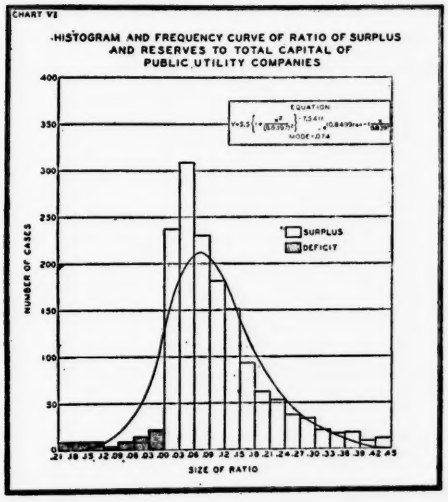
[10] Ratios for common and preferred stock to total capital are not given here because the frequency distributions did not have satisfactory centers of concentration.

of years, and where the reserves are heaviest because of the age of the physical properties, the ratio is .070 (Table III). The ratio of .030 for companies in the South is in marked contrast. In the West and Middle West the representative ratios are .052 and .053 respectively. Pronounced differences exist in the types of distribution of ratios for companies in the different sections of the United States. This is largely because of the many cases with ratios above the representative ratio. Thirty-three per cent. of the observed frequencies in the East had a ratio of surplus and reserves exceeding .15 of the total capital. Twenty-two per cent. of the cases exceeded a ratio of .15 in the Middle West, and only 7% and 5% of the companies in the West and South respectively had a ratio above .15. In other words, not only is the representative ratio higher in the East, but most of the companies there have ratios much larger than this normal ratio. This is also the condition in the Middle West. However, few companies have ratios much larger than the typical ratio in the South and West (Table III).

With respect to actual deficits mid-western companies are in better position than those in any other section of the country. Only 1% of the mid-western companies have deficits contrasted to 9%, 7%, and 3%, respectively, for companies in the West, East, and South. Companies in the South, where regulatory agencies are not so strict or have more limited powers, have very few deficits. But western companies under newer and less stable conditions have the highest percentage of deficits.

Not only do the largest companies (those with 50 millions or more operating assets) have a larger surplus and reserves to total capital ratio (Table III) than the two groups of smaller companies, but they are in better position with respect to percentages of deficits. The smallest group has 5.6% of its cases as deficits; among medium-sized companies 6.3% showed deficits; and in the group of largest enterprises no instance of a deficit was found.

It is not surprising that most of the deficits that have occurred in the utility field are found among traction companies (Table III). Analysis of the data shows that 13% of the traction companies have impaired their capital, whereas only 2% of the gas and electric utilities, and 3½% of the holding companies have encroached upon their capital. In spite of the fact that traction companies have most of the deficits, their representative ratio of surplus and reserves to total capital is .077 which is considerably higher than the ratio for either of the other types of companies. The study also shows that the companies having substantial surplus and reserves are the gas and electric companies located in the eastern states. Thirty per cent. of the gas and electric, 14% of the traction, and 11% of the holding companies have surplus and reserve items which constitute .15 or more of their capital.



This ratio of surplus and reserves remained constant from 1917 to 1919, and then increased to .077 by 1924. From 1921 and to date, the utility industry as a whole has been truly prosperous, one of the results being the substantial investment of earnings during the last few years (Table III).

III. Summary

In general, the property investments of utility companies are surprisingly similar. With the exception of the current assets, which vary more than 100%, no considerable variations occur in the typical ratios when analyzed in different classifications of data. On the whole, over a period of years the proportionate investments in fixed capital have been decreasing, while the proportion of working assets has been increasing.

The manner in which the capital has been secured, and the financial structure pyramided differs greatly according to type, size and location of the company. Thus the large companies use only a small portion of stock, and this tendency is more pronounced for companies in the East, and still more so for those in large industrial centers. The question arises as to whether such companies are endangering themselves by an extended trading on the equity. However, such a question can be answered only in the light of the turnover of the capital, and the net earnings on the capital. Most companies tend to maintain a balance between creditors' and owners' capital. However, as population and demands for service increase and revenues become more regular, it is to be expected that a greater use will be made of borrowed capital.

REAL ESTATE ACTIVITY IN CHICAGO ACCOMPANYING THE WORLD'S FAIR OF 1893

By H. MORTON BODFISH*

ON the eve of the World's Fair in 1893 Chicago was looked upon as the Wonder City of America, and justly so. It had rebuilt itself from the ashes and ruins of the great conflagration of 1871 into the second largest city of the United States. Its population had increased from 289,977 in 1870 to over 1,000,000 people in 1890, surpassing the city of Philadelphia in 1889. Furthermore, the city had been able to produce a spectacle of masonry and architecture in its World's Fair exhibits which attracted the attention of the entire world.

But all of the great activity accompanying the Exposition was not expended on the Fair itself. A particularly important phase of the enterprise had to do with the construction of office buildings, apartments, hotels and homes which had to be built to accommodate the business and visitors that would gather from all parts of the globe to visit this Wonder City and its Wonder Exhibition. The activities which took place in the real estate market, including building, subdivision and transfer of property, form the subject matter of this paper. The order of treatment will be chronological. For example, what was the stage setting of the real estate market prior to the World's Fair on which these land merchandisers and financiers played their parts? What were their activities during the exposition year of 1893? Also what results followed the World's Fair with regard to the urban land market?

Before discussing the real estate market prior to the international exhibition, a short account of the origin of the Fair itself is worthwhile, in order that we may correlate the actual growth of the Fair with the activities of the real estate men. The first move toward holding the World's Fair of 1893 in Chicago was the action of the Interstate Industrial Exposition League, which, on November 14, 1885, passed a resolution to hold a World's Fair in Chicago.[1] On July 22, 1889, the Chicago City Council requested the mayor of the city to try to get the proposed Fair for Chicago. The mayor immediately appointed committees to present Chicago's case to Congress and to induce as many people as possible to approach their congressmen on the subject. The Fair was incorporated on August 14, 1889, and immediately funds were solicited. This was four years before the date of opening. Congress voted its approval, and when the necessary $10,000,000 had been raised, President Harrison issued a proclamation on December 24, 1890, announcing that the Fair was to be held in Chicago, and invited the nations of the world to participate. The opening of the Fair was to have occurred on October 12, 1892, but

* The author is indebted to Mr. Harold G. Avery and Mr. Lewis D. Thill for assistance in gathering the information on which this article is based. Several men active in business in Chicago during the Fair have given considerable time in assisting to paint for the writer a picture of the real estate conditions at that time. Their helpfulness is appreciated. The justification for this article lies in the attempt to describe a real estate market under the influence of an international exposition. What are the attitudes of mind present in such real estate activity?

[1] Moses and Kirkland, *History of Chicago* (Chicago: Munsell & Co., 1895), Vol. II, p. 466.

on account of insufficient time to complete the buildings and exhibits, the gates of the Fair were not thrown open to the public until May 1, 1893. The closing date of the exposition was December 31st of the same year.

Conditions in the Real Estate Market Prior to 1893

In order to interpret the real estate activity of the World's Fair period, a general view of economic conditions prior to 1893 is necessary. The United States as a whole enjoyed continued prosperity from the depression period of 1884 until 1893.[2] Furthermore, as soon as the Fair was a certainty, conjectures were immediately made as to its effect on real estate in the vicinity of Chicago. Three ways in which the Fair would help the real estate market were stressed:[3] (1) A certain percentage of the people who came to see the Fair were almost sure to stay and make the city their home; (2) Each person visiting the city on account of the Fair would spend at least $50 there, a considerable part of which would ultimately find its way into new construction; (3) People who had their money invested in business enterprises connected with the Fair would afterwards have to find new investments for their capital, and a part of this would go into real estate.

It is questionable whether these claims were based upon the satisfactory experience of Chicago real estate men of this period. Nevertheless, conditions prior to the World's Fair of 1893 could in no way be looked upon as a handicap to the successful activities of this group of men. A few years preceding the international event of 1893, Chicago experienced the greatest real estate boom it had felt since 1872, the reconstruction period after the great fire. The boom extended from 1890 into the early months of 1892, being the culmination of a 10-year rise in the index figures of real estate transfers (Table I).

TABLE I. REAL ESTATE TRANSFERS IN CHICAGO, 1872–1899, INCLUSIVE*

Year	Number of Sales	Amount (000 omitted)
1872	.....	$78,183
1873	.....	78,427
1874	.....	67,871
1875	.....	53,149
1876	.....	42,153
1877	.....	38,123
1878	.....	42,126
1879	.....	38,123
1880	.....	43,682
1881	.....	54,854
1882	14,183	56,514
1883	14,691	51,715
1884	14,956	51,924
1885	15,463	57,482
1886	19,943	87,006
1887	23,993	95,146
1888	24,927	93,014
1889	31,151	135,781
1890	43,272	235,185
1891	42,669	182,709
1892	38,912	181,964
1893	32,692	132,506
1894	30,601	121,112
1895	27,546	133,704
1896	22,762	105,065
1897	.....	99,556
1898	.....	93,100
1899	.....	108,210

* Data for the years 1872–1881 were found in A. T. Andreas' *History of Chicago* (Chicago, 1884–6), Vol. III, p. 447; for 1881–1896 in *Real Estate & Building Journal* for years quoted; and for 1897–1899 in M. H. Putney, *Real Estate Values and Historical Notes of Chicago*, (Chicago, 1900), p. 104.

Over 2¼ million dollars worth of real estate changed hands in the peak year of 1890, during which time the fever of speculation struck the populace and continued throughout the next two years. An exhibit of the bank clearings of Chicago from 1884 through 1892 shows a continual steady increase, indicating the volume of business transactions that were being carried on in the city at this time (Table II). Chicago was moving concurrently with the times, and times

[2] Willard Long Thorp, *Business Annals* (New York: National Bureau of Economic Research, Inc., 196), pp. 134–136.

[3] *The Economist*, Chicago, August 13, 1892.

TABLE II. BANK CLEARINGS IN CHICAGO, 1884–1898*

Year	Amount (000 omitted)	Percentage Increase or Decrease
1884	$2,266,433	.....
1885	2,318,579	+ 2.3
1886	2,604,762	+12.3
1887	2,969,216	+14.0
1888	3,163,774	+ 6.6
1889	3,379,925	+ 6.8
1890	4,093,145	+21.1
1891	4,456,884	+ 8.9
1892	5,135,771	+15.2
1893	4,676,960	— 8.9
1894	4,315,440	— 7.7
1895	4,614,979	+ 6.9
1896	4,413,054	— 4.4
1897	4,575,693	+ 3.7
1898	5,517,335	+20.6

* Taken from the *Commercial and Financial Chronicle* for each year.

were indeed prosperous prior to the World's Fair.

Building Activity. Enormous strides were made in the building field. Tradesmen, painters, carpenters, and masons flocked to Chicago prior to the Fair year. Buildings were sprouting up around the Midway and Jackson Park, and noteworthy structures such as the Boyce, the Ellsworth and Marshall Field's new retail building were rising in the downtown section. The Old Colony, the Columbus and Isabella buildings were begun in 1892; and the present Marquette building made its appearance in 1893. It became evident at this time that business men were placing their money in downtown property with utmost confidence in the safety of their principal.

At Jackson Park builders were feverishly hurrying the completion of the World's Fair edifices.[4] Numerous apartment houses and hotels were being built in the neighborhood of the Midway and close to the elevated lines. The peak of the building program was reached in 1892 (Table III), when most of the apartment and hotel projects were put under way. It is a noteworthy fact that almost all the building enterprises which were started late in 1892 and even in the early part of 1893 were carried through successfully, despite the oppressing financial conditions that followed.

Subdivision Activity. Operation in subdivisions began after 1890.[5] During the real estate boom in the following two years the idea became prevalent that almost the whole of Cook County was eligible for subdivisions with Chicago as a center. This thought apparently prevailed throughout 1892, when 589 subdivisions were laid out in the Chicago region, including 1,681 blocks and 65,697 lots. Some of the lots were for multi-family structures but the majority were for single-family residences. If a family of average size (4.2 persons) were assumed to occupy each lot, enough land was urbanized in a single year to accommodate 275,927 persons. Unfortunately, we have no data for the preceding years. Moreover, this figure is for Cook County alone. The peak of the period was in the

TABLE III. SUMMARY OF BUILDINGS ERECTED IN CHICAGO, 1888–1899*

Year	Number	Feet Frontage	Cost (000 omitted)
1888	4,982	116,409	$20,360
1889	4,931	119,573	25,065
1890	11,608	266,284	47,332
1891	11,805	282,672	54,201
1892	13,194	327,573	64,740
1893	8,359	216,893	28,708
1894	9,837	231,948	34,295
1895	8,633	218,360	35,010
1896	6,273	155,679	22,403
1897	5,294	.....	21,777
1898	4,066	.....	21,281
1899	3,792	.....	20,856

* Data for the years 1888–1895, inclusive, were found in *The Real Estate and Building Journal*, Jan. 4, 1896, p. 9; for 1896, *Ibid.*, Dec. 12, 1896, p. 1217; for 1897 to 1899, inclusive, M. H. Putney, *op. cit.*, pp. 104–5.

[4] *Inter-Ocean Daily*, January 1, 1893.

[5] *The Economist*, November 22, 1890, says, "New acre operations are few in number and some unpleasant settlements are now being made on old contracts. . . . The lot trade is active and will remain so. . . . It is now a good time to operate subdivisions." See also the issue of the above periodical for January 1, 1892

spring and summer of 1892 (Table IV). However, almost at the same time people became skeptical of the subdivision activity. Some of the owners of outlying acreage, who saw their neighbors sell out at unheard of prices during the inflation period and thought that they could do better by holding on, began to think that their theory was wrong, and instead of being visited by the real estate agent on their farms, they now pursued the agent to his city office. The magic of the name of Chicago could not alone add 200% to 300% to the value of all farm lands which happened to lie in Cook County or in adjoining portions of Lake County, Indiana, or Lake County, Illinois.

The subdivision of tracts of comparatively valueless lands away from any lines of transportation was done principally by a class of exchange men.[6] Worthless subdivisions, 30 and 40 miles from Chicago, without transit facilities, were opened simply for the purpose of making lots which might be offered in trade all over the country in return for anything of value. An instance is noted of a subdivision operator of this character who traded three lots for a horse and buggy, and took for an adjoining lot the equivalent of $1,200 under the grossest misrepresentation. The lots in question were in a subdivision on the flats along the Indiana State line in the extreme southern portion of Cook County, three miles from any railroad and as far from any other subdivided property.

TABLE IV. SUBDIVISION RECORDATIONS IN CHICAGO DURING 1892*

	Subdivisions	Blocks	Lots
January	31	101	3,775
February	44	179	6,008
March	60	129	3,992
April	76	210	7,909
May	60	253	10,353
June	53	155	5,406
July	63	237	10,260
August	41	103	5,001
September	41	73	2,733
October	42	83	3,448
November	37	78	3,132
December	41	80	3,680
Total	589	1,681	65,697

* *The Real Estate and Building Journal*, December 31, 1892, p. 1676. Also *Chicago Tribune*, January 1, 1893.

Operations in Acreage. Trade in acreage property, which had revived in 1889, grew at a tremendous rate in 1890, reaching at times great speculative proportions. One of the main causes of this revival was said to be the location of the World's Fair in Chicago, but another influence was found in the decision of manufacturers in various parts of the country to locate their main works or branches in this city or nearby.[7] Prominent among the localities for this speculation was the vicinity of the Stickney tract in Lyons, or land about Section 21, now Cicero.

After this the acreage trade was carried on spasmodically during this pre-fair period. Demands for acreage property corresponded with the subdivision activities during 1891 and 1892. However, for more than a year prior to the Fair this phase of the real estate market lay comparatively dormant.[8] A few exceptions may be noted such as the transfer of large blocks of cheap land, which on account of transportation facilities, seemed highly eligible for residential and manufacturing development.

The syndicate method of disposing of land was more in favor about this period than at any previous time in the history of Chicago. The plan was to purchase large blocks of land and issue shares representing lots and to sell them to a large

[6] *The Real Estate and Building Journal*, April 29, 1893.

[7] *Economist*, Chicago, January 1, 1891.

[8] See *Inter-Ocean Daily*, Chicago, January 1, 1893; also *Chicago Daily Tribune*, January 1, 1893.

number of people. In this manner the ownership of large tracts could be divided. Syndicates of capitalists who were wealthy enough to operate in this manner succeededi n developing certain suburban sections. Chicago Heights, West Pullman, Harvey, Waukegan, South Waukegan and Stickney were successes, with West Pullman probably the best example. A host of other new manufacturing and residential suburbs were equally legitimate and worthy of attention but they were not pushed as vigorously as those mentioned. Other so-called syndicates and investment companies forced the market with thousands of lots which seemed to be an abuse of the market considering the financial and realty conditions of the times.

The foregoing description gives a general idea of the real estate market prior to the Fair year of 1893. But the prosperity which had characterized the real estate business up to this time began to lag and evidences of inactivity were apparent during the latter part of 1892. It therefore behooved the real estate group to look into the future, and to estimate what the Fair year and the years to follow had in store for them. On December 31, 1892, the *Real Estate and Building Journal* summed up the conditions of the past as follows: "Two things are necessary to sustain a strong and healthy market, viz., a long list of buyers and a long list of actual bargains to choose from. Unless everybody's judgment is wrong and the World's Fair a failure we shall have many prospective buyers, but we must persuade owners to come half way. There is such a thing as getting 'out of sight' with a price list. Compared with 1890 we have had a dull season, but compared with other years preceding, the dying year ought not to pass away without due appreciation for the good that it bore us." However, the same Journal stated a week later, "On the other hand, no one can accurately estimate the effect which the World's Fair will have on the local real estate market." Thus optimism concerning the future real estate business was not at its highest pitch.

Real Estate Activities During the Year 1893

Although the World's Fair did not open until May 1, 1893, in this paper the year 1893 will be spoken of as the Fair year. Real estate men looked forward to this period with confidence and fully expected the Fair year to surpass the high mark which had been set for volume of trade in Chicago. Although the real estate transfer index had been on the down-grade in 1892 (Table I) the volume of general business, as reflected in bank clearings in Chicago reached the high figure of over five billion dollars in the year prior to the Fair (Table II). Consequently, real estate men at this time were justified in making bright predictions for the future year. All through the winter months operations in choice properties of all kinds, especially business properties, were of a character to lead real estate men to believe that the general market would be satisfactory when spring opened. Downtown properties were purchased by investors, and a great many loans at low interest rates were placed. The insurance and trust companies were willing to place loans at 5%, demonstrating their confidence in Chicago realty.

Two transactions in the Calumet region during the month of January lent an air of activity to the real estate business and confirmed the opinion, which was gradually gaining ground, that the general real estate business for the year was to be a surprise to those who had been prophesying that but little would

be done until after the World's Fair.[9] In February interest in subdivision property was renewed and the idea was becoming quite prevalent that eligibly located lots at reasonable figures would be in demand during the Fair.[10]

Furthermore, many dealers made special preparations for the summer business which was anticipated, undoubtedly prompted by the facts listed above. It was confidently believed by all that World's Fair visitors would buy Chicago property in generous slices; and the hopeful brokers had reason to scent some indication of activity in the slight flurry of trade during the winter months.

Early in March, however, general business conditions throughout the United States as a whole became stringent. The money market tightened and this was the beginning of a depression period which was the unforeseen factor in the situation deranging the best laid plans for the real estate activity during the summer. A financial panic was imminent. There was a drain on the Treasury's gold stock, which many claimed was attributable to the Sherman Silver Law, and the amount of gold in the United States coffers fell below the 100 million dollar mark. Such a condition, coupled with the fact that the government income was unsatisfactory, brought on a panicky feeling in financial circles which soon was generally apparent. Commodity prices declined further in the spring; interest rates increased; the wheat and corn crops were very small with low prices; and industrial stocks collapsed.[11] The country experienced a severe panic in May, with the crisis coming in August. The Silver Purchase Act was repealed in August, easing the money market late in the year.[12]

In Chicago a heavy liquidation in stocks took place; notes were called in; several banks suspended business; and the money market became exceedingly tight. Such events did not fail to have a depressing effect on the buyers of real estate. The opening of the World's Fair was shrouded in the clouds of a financial storm so widespread that everything was compelled to bow before it. As the last days of April passed by, real estate men began to watch with interest the character of the World's Fair visitors. They could not be shaken from the idea that a great deal of property would be sold during the summer to people who would discover for the first time how great Chicago really was. Many people had not seen the Wonder City whose growth had been heralded to the far corners of the globe. The real estate men pinned their hopes on the Fair, because it was with these hopes that they expected to battle the results of the depression which would be sure to follow a panic.

On May first the gates of the Fair were formally thrown open to the public. Jackson Park had been transformed into a huge garden city, with a playground extending a mile along the Midway to Washington Park. The official representatives of foreign powers were on hand to view the miracle of masonry and architecture which contained the products, machines, inventions, art, and architecture of all nations. Visitors and the people of Chicago regarded the Fair as an eight-months' holiday; and real estate men soon realized that such a festive attitude was not conducive to an active real estate market. One of the writers of the times sums up the real estate man's difficulties in this way:[13]

[9] *Real Estate and Building Journal*, January 28, 1893, p. 107.

[10] *Ibid.*, February 4, 1893, p. 139.

[11] Thorp, *op. cit.*, p. 136.

[12] *Ibid.*, p. 136.

[13] *The Real Estate and Building Journal*, April 29, 1893.

"To boil down all of the real estate man's troubles in one sentence requires a heavy strain on one of Gould Brown's rules for the construction of complex sentences. Unless he (the agent) held the agency to sell the Palmer House or the Post Office site, he would be compelled to deal in acres, or World's Fair hotels, or factory sites, or suburban lots, when he would be confronted with climactic conditions that have never been before; by the gold scars superinduced by a complication of diseases never yet sufficiently explained by anybody; by the reactionary effects of the boom of 1890; by a large surplus of hotel sites and hotels; by an excessive supply of suburban lots, and by a six months' holiday."

The intense interest in the World's Fair made it almost impossible for brokers to carry through transactions during the months in which the Fair monopolized attention. Because of the constriction of the money market, promising negotiations had to be dropped and the interested parties flatly refused to resume dealings until they could find where they stood financially. The people who had contemplated making investments were infected by a feeling of distrust and uncertainty which permeated business circles, and they decided to wait for more favorable circumstances.

Throughout the summer and autumn the real estate market was in a depressed state, and gradually the lack of activity began to drive members of the real estate business into other activities. Many real estate dealers failed; some gave up the business permanently; but others intended to enter the field again when the market showed signs of rejuvenation.

After this general survey of the situation, it would be well now to notice a few individual aspects of the real estate market.

Building Activity. Take the building situation for instance. A glance at Table III shows that building activities fell off enormously during 1893. Compared with the years prior to the Fair, building could have been said to be at a standstill. In 1892 over 64 million dollars were invested in the building trade as against only 28 million in 1893. Many buildings which were begun in 1892 did not reach completion until the Fair year, which gave to the city a certain bustle of activity while the visitors were within its limits. The stringency of the money market had its discouraging effect on the building industry. All projects which involved a large amount of capital were abandoned. Capitalists could not be induced to invest in large enterprises which required an outlay of money, because the high rates of interest made it difficult to secure loans and rendered ordinary business risks still more perilous.

Subdivision Activity. The unsatisfactory nature of things soon began to be apparent in the acreage and subdivision trade during 1893. As early as January acreage property was said to be even more neglected than in the year 1891,[14] and large areas of land which had previously been in favor were unsalable. The sale of cheap lots was on a small scale and few new subdivisions were exploited. The speculative element which creates boom periods was absent, and monthly index figures of real estate transfers were showing a sharp downward trend (Table V). In April, 1892, the number of real estate transfers began a steady monthly decline, which extended over a period of almost three years, with a slight revival in the spring of 1893, prior to the panic in May of that year. The total amount of sales also dropped sharply from 181 million in 1892 to 132 million the following year. Volume of sales likewise steadily de-

[14] *Economist*, Chicago, January 1, 1893.

clined after the early months of the Fair year, and in October and November the totals were almost half what they were in the same months of 1892.

Operations in Acreage. Acreage business which lost caste in 1892 continued to be regarded with disfavor and the subdividers who had expected a most active year had nothing to do but sit in their offices and watch the crowds go by. Buyers of real estate could no longer be influenced by brass band methods of selling. However, a few people would still buy property simply because it lay in parcels 25 by 125 feet, but it was difficult to find purblind purchasers like those of the boom years, when hundreds of acres of indifferent farm land, away from all lines of transportation, had been cut up into lots and disposed of on easy terms. Swamp land, which was worth probably $30 an acre and which could not be reached by turnpike six months in the year, failed to sell in 1893 even in the quarter section quantities whereas it had previously brought prices ranging from $25 to $75 per lot.

The old real estate firms discovered the changing conditions and adapted themselves accordingly. Subdivision lots which were sold during the early part of the year were those eligible for improvement by home builders; and there was little demand for suburban acreage except along the North Shore.

In the syndicate field concurrent with the opening of the Fair, announcement was made of one of the largest real estate deals ever ventured into in Chicago. The land contracted for and to be purchased involved an outlay of over $6,000,000. The promoters of the deal perfected an incorporation early in March under the laws of Virginia and assumed the title of the Chicago Dock and Investment Company. The total number of shares to be controlled by the syndicate was in excess of 7,000. The location of the property was south and southeast of the city, part of it lying just across the state line in Lake County, Indiana. The tract consisted of 2,845 acres, valued at approximately $1,500 an acre. Officers of the company subscribed for $12,000,000 of the stock and expected to realize $6,000,000 from the sale of bonds, the proceeds of which were to be applied to the purchase of the land and improvements. Outside of such splurges which could only be made by wealthy real estate men, nothing else seemed to indicate that subdivision men were able to make a fair livelihood.

The Rental Market. One phase of the real estate market did present an optimistic picture during this period. This was the renting and leasing of hotels, apartments and downtown property.

TABLE V. NUMBER AND AMOUNT OF REAL ESTATE TRANSFERS IN CHICAGO BY MONTHS, 1890–1894, INCLUSIVE*

Amount of Sales †

	1890	1891	1892	1893	1894
January	14,806	15,113	10,803	10,967	10,604
February	10,490	14,139	11,951	11,426	7,746
March	14,995	12,250	19,850	15,603	10,795
April	18,697	19,716	19,178	12,173	11,584
May	23,871	19,799	16,572	15,700	11,146
June	27,542	15,613	12,159	10,078	9,976
July	22,707	17,028	24,035	9,547	7,706
August	22,972	12,191	11,261	11,068	6,841
September	16,617	16,403	9,476	8,165	10,865
October	21,164	11,112	15,791	8,367	9,051
November	26,771	14,422	15,206	8,366	10,777
December	14,553	14,923	15,666	11,046	12,221
Total	235,185	182,709	181,964	132,506	121,112

Number of Transfers

January	2,831	4,073	2,845	2,675	2,276
February	2,404	3,303	2,841	2,744	2,043
March	2,822	3,471	3,164	3,618	2,880
April	3,269	4,608	4,240	2,842	2,766
May	4,430	3,861	3,613	3,314	2,674
June	4,566	3,511	2,845	2,726	2,903
July	3,514	4,195	3,591	2,426	2,109
August	4,058	2,991	2,810	2,909	2,061
September	3,510	3,658	2,725	2,220	2,810
October	3,749	3,092	3,614	2,408	2,272
November	4,740	2,782	3,125	2,119	2,195
December	3,378	3,124	3,499	2,691	3,612
Total	43,272	42,669	38,912	32,692	30,601

* Figures were compiled from the *Real Estate and Building Journal*; year 1890, p. 1676, December 31, 1892; years 1891, 1892, 1893, p. 1479, December 30, 1893; year 1894, p. 1234, December 29, 1894.

† In thousands.

Rental agents everywhere were kept busy seeking tenants who would pay higher rates than the next man. The renting departments were given an importance which they did not have during the speculative years of 1890 and 1891. This was the result of the increase in rentable space following the extended period of building activity. State Street rents had been advanced steadily and to such a point that they promised to crowd minor business houses into other streets.

Speculation in rentals had not fully developed in other years, but during 1893 it became the feature of the real estate market. Certain organizations which had operated in speculative leases in 1892 continued to operate on a large scale during the year of the Fair, and their success was so decisive that a good many others were drawn into the field. The main floors of many of the new large mercantile buildings were leased to speculators who then subleased them at handsome terms which netted considerable profit. Office space was in good demand. However, the real estate agents were of the opinion that Chicago was overbuilt as to structures for office purposes.

The real estate brokers who advertised their properties were the most successful. Although *bona fide* owners of good subdivision property did a little business every month, the subdivision men who closed the most sales during the period were those who advertised excursions to outlying property, such as Columbia Heights, Edgemoor, and West Pullman. This group of men succeeded in selling lots to some of the prospects taken on these subdivision tours.

The two accompanying advertisements which appeared in the *Chicago Tribune* give one an idea of the character of the subdivision announcements during the World's Fair Year.

EDGEMOOR *

A Strictly High Class Residential Suburb

In the beautiful ridge districts on Western Avenue Boulevard between 79th and 83rd Streets

50 foot lots $1,250—$2,000

$3,000 Building Restriction. $1,000 cash, balance monthly, will buy a lot and build a house with all improvements

Handsome improvements, macadam streets, granite walks, boulevard lamps, fine shade trees, and pure rock springs water

Chicago Central R. R. April first inaugurated a splendid suburban service to Edgemoor

* *Chicago Tribune*, April and May, 1893.

West Pullman *

Is Bound To Be a Great City in Itself

All Values Will Double Inside of a Year

One-third of the lots in West Pullman can yet be bought at the original platted price

Now is the time to investigate

No such chance has ever been offered in Chicago

All prices will be increased May first

* *Chicago Tribune*, April 2, 1893.

The Real Estate and Building Journal summed up this period in the following paragraph:[15] "The year 1893 will long be remembered by the real estate fraternity of Chicago as a twelve-month of dullness, disappointment and discour-

[15] *Real Estate and Building Journal*, December 30, 1893, p. 1478.

agement, second to no like period since 1873, and comparable with that year in almost every particular except hopelessness."

The plight of the real estate group during the World's Fair year was indeed a discouraging one. Building activity was at a standstill, acreage and subdivision activity on the downward trend, and the country as a whole in the throes of one of the most far-reaching depression periods it had experienced for a good many years. The World's Fair and all of its visitors only acted as a buffer to a condition that might have been worse. The one enlightening feature that bolstered the hearts of the real estate men was the renting and leasing activity. This aspect of the real estate profession seemed clearly profitable at this time, and advertising was in a measure helping to sell subdivision lots in outlying suburbs which later became thriving communities in the Chicago region. Indeed, the real estate fraternity looked forward with small expectations to the coming years.

Real Estate Market Following the Fair

For several years subsequent to 1893 the real estate market in Chicago was in a depressed condition (Table I). However, this condition must not be blamed entirely on the fact that an international exposition was held in Chicago during 1893, as some of the literature of this period did.[16] General business conditions throughout the entire United States were in a depressing state from the years 1894 to 1898, inclusive.[17] During 1894 the country was affected by a severe case of non-activity in all of its industries, which was accompanied by widespread unemployment, many business failures, an average wheat crop with low price, and a reduction in foreign trade. After a slight recovery during the late months of 1895, conditions returned in 1896 to the state of depression. Commodity prices reached the bottom in 1897 and business as a whole yielded to a gradual revival later in the year in spite of a severe bituminous coal strike. Excellent crops in wheat, corn and cotton were reported that year and higher prices in wheat and corn were evidenced.

In the face of such conditions, even the most optimistic real estate man could not predict any more than a continued period of dullness with possibly a month or two of slight prosperous activity. Only in September, October, and November, 1894, did the aggregate value of transfers surpass the figures for 1893. During these three months the total number of transfers increased 8% and the consideration nearly 25% over the same months of 1893. This showed a greater relative proportion of large transfers, and indicated perhaps an increasing interest in real estate investments toward the close of the year. The transfers were mainly of town property. No revival of the lot trade was evident.

By January, 1896, the bad effects of the boom period almost six years before were nearly wiped out. Weak holders had withdrawn from the real estate business and the vicious methods resorted to by some of the subdividers to sell lots covered by blanket mortgages had been thoroughly exposed.

[16] On January 2, 1897, the *Real Estate and Building Journal*, says: "Referring to the recent bank failures, a New York journal, supposed to be friendly to Chicago, says: 'Ever since the World's Fair, Chicago has been a doubtful spot on the financial map, and it would not be surprising if it had not yet paid the whole price for the honor of being the scene of that national celebration. Evidently these institutions have been struggling with unwieldy loads for a good while, and that they have now to give up the fight is no reflection upon standing institutions which owe their stability to better methods and more conservative management.' "

[17] Thorp, *op. cit.*, p. 137.

Contrary to the expectations of some and contrary to the usual situation, the suburbs recovered first from the effects of the panic and depression. The reasons for brighter prospects in the suburban lot trade were the increased transportation facilities, making it possible for wage earners to own homes and escape the high rents or heavy taxes. One of the strongest arguments used at this time by suburban lot dealers was that they were outside of the drainage district and outside of the city whose taxes were threefold greater than in the suburbs. Berwyn, South Oak Park, Harlem, Maywood, Franklin Park, Irving Park, Norwood Park, Des Plaines, Winnetka, and other neighboring places actually grew larger every day by reason of these advantages.

Furthermore, investors were basing their calculations almost wholly upon income from rentals, and in view of this fact, the marked decline of rents during 1895 caused a corresponding decline in the offers made for city property.

Building activity also suffered for many years following the Fair (Table III). By the middle of the year 1896, this phase of the real estate business seemed to be in about as bad a condition as it could be. During the month of July, 543 permits for buildings were issued. In July, 1895, 884 permits were issued. The value of the improvements in 1895 was $3,717,035, while the amount of money put into the building trade in July, 1896, was $1,760,650, showing a decline in the investment of nearly $2,000,000. This condition was ascribed to the fact that it was a presidential year.[18] The comparative statement for June and July of 1895 and 1896 is shown below:

[18] *Real Estate and Building Journal*, August 15, 1896, p. 778.

TABLE VI. BUILDINGS ERECTED IN CHICAGO, JUNE AND JULY, 1895 AND 1896*

	1895		1896	
	June	July	June	July
Buildings	965	884	630	543
Feet Front	25,273	21,983	18,323	12,818
Cost	$4,252,313	$3,717,035	$1,730,295	$1,760,650

* *Real Estate and Building Journal*, August 15, 1896, p. 778.

This depressing condition in the building trade continued throughout the year of 1896. As compared with 1895, the building permits for 1896 were only about three-fourths as many, and for less than two-thirds the cost (Table III).

The Stewart, Fisher and Silversmith buildings appeared at this time in the downtown district. The Fisher building, which was completed in the early part of 1896, was the last of a notable series of great office buildings. Contrary to the general expectations its space was in great demand despite the very dull times, and many leases were signed the year it was completed.

By 1897 the real estate market became somewhat more active and agents looked forward to a more encouraging future. Although the real estate transfer index did not show an upward trend until 1899 and the building trade was not to begin its new era until the early part of the new century, business conditions in Chicago took new life with the coming of 1898 (Table II). The retrospective view of the real estate market was far more consoling in 1897 than it had been for several years. The *Real Estate and Building Journal* gave this message in its January 2, 1897, issue: "It is the near future that concerns the agent and owners. After a long period of waiting and almost painful suspense running back about three years, the real estate agents of Chicago feel that a change for the better must come with the return of spring."

From this description of real estate activity accompanying the World's Fair of 1893 it is clear that evaluation of the influence of the Fair alone is extremely difficult. The years immediately preceding 1893 were marked by boom characteristics, which may be credited largely to the influence of the Fair. The story of what happens to the purchasers in such markets need not be told. But even here the Exposition cannot be held solely responsible, for about this time the country was just awakening to the strategic location of Chicago as a center for industrial and commercial development. Realization of Chicago's advantages, on the other hand, may have been the outcome of the publicity which the city received from the Fair. Equally difficult to evaluate are the effects of the real estate boom. Like all booms it was followed by a slump, of which there was some evidence late in 1892, considerably before the nation-wide depression set in. The question is: What would have been the outcome had there been no general depression in 1893? Statistics may show slightly increased payrolls, industrial production and real estate values but did the real estate operator correctly anticipate these gains in fundamental factors? Or did he overestimate them several times and pass this capitalized optimism on to so-called "real estate investors"?

THE PRE-OWNERSHIP STEPS ON THE "AGRICULTURAL LADDER" IN A LOW TENANCY REGION

By CARL F. WEHRWEIN

THE theory has been advanced that landless prospective farmers in the United States climb to ownership of the land they operate by a series of rather well-defined stages. This theory of the "agricultural ladder" is now being tested by analyzing the facts in communities of widely differing tenure conditions. Two previous articles[1] considered the operation of the "agricultural ladder" in a region of high tenancy and a subsequent article[2] outlined the effect of land credit conditions on the tenure situation in that area.

Description of the Area

The area studied in this article was chosen because it represents the other extreme—a region of low tenancy. The Town of Newton, Manitowoc County, is typical of Wisconsin in many respects, particularly the eastern part of the state. In a former article many of the general facts regarding the area were presented[3] but can be briefly recalled here. Manitowoc County is about 75 miles north of Milwaukee, and Newton is one of the townships bordering on Lake Michigan. In fact, the lake cuts off an area of 873.1 acres, leaving a net land area for Newton Township of 22,166.9 acres, according to government survey.

The soil is of good quality, except that there is a strip of light sand along Lake Michigan and small wet spots are fairly evenly distributed over the whole area. The north central part is hilly with many small lakes and generally a heavy clay soil. The rainfall is slightly more than 30 inches. The average growing season is 171 days. The mean temperatures of the various seasons are as follows: spring, 42 degrees F.; summer, 67 degrees; autumn, 50 degrees; and winter, 22 degrees. Because of the nearness to Lake Michigan, spring and fall are more retarded, the temperature more uniform throughout the year, and the humidity higher than in regions remote from the lake.

The short growing season and low mean summer temperature (67 degrees) make corn growing unprofitable, although the earlier maturing varieties are used extensively for silage purposes. Grain, hay, legumes and forage crops of all kinds, and pastures form the basis of the dairy industry of the area. Most of the farmers have grade cattle, although pure-breds are not at all uncommon. The township was formerly a wheat and general cereal growing section like the rest of the state, but the transition to dairying as the principal industry occurred about 1900 to 1905.

Settlement of the area began in 1847 and within 10 years practically all the farm land of the township had passed into the hands of farmers. Some of the

[1] William Ten Haken, "Land Tenure in Walnut Grove Township, Knox County, Illinois," 4 *Journal of Land & Public Utility Economics* 13–24, 188–198 (February and May, 1928).

[2] David Rozman, "Land Credit in Walnut Grove Township, Knox County, Illinois," 4 *Ibid.* 305–312 (August, 1928).

[3] David Rozman, "Land Credit in the Town of Newton, Manitowoc County, Wisconsin, 1848–1926," 4 *Ibid.*, 371–384 (November, 1927).

land, however, had been in the possession of speculators for as much as 11 years prior to 1847. The general stability of the population as well as the almost complete absence of tenancy was noted in the former article. This latter fact was the main reason for selecting the area for detailed study.

Altogether 267 farmers, owners and tenants, reside in the township. The land, however, is *owned* by 283 individuals; the difference of 16 persons represents absentee owners who have leased their lands and some farmers who live in adjacent townships but who own land in Newton as well.

TABLE I. PERCENTAGE OF FARM TENANCY IN MANITOWOC COUNTY, WISCONSIN, BY CENSUS PERIODS*

Year	Per Cent.
1880	1.92
1890	2.33
1900	3.78
1910	3.58
1920	4.33
1925	4.14

* Adapted from the 10th, 11th, 12th, 13th, and 14th Census of the United States and the United States Census of Agriculture; 1880, Vol. III, pp. 100–101; 1890, "Statistics of Agriculture," pp. 196–197; 1900, Vol. V, pp. 138–139; 1910, Vol. VII, pp. 917 and 924; 1920, Vol. VI, pp. 462–463; and 1925, "The Northern-States," pp. 664–665, respectively.

The low percentage of tenancy in this area is shown by the census figures for Manitowoc County from 1880 to 1925 (Table I). The rate of tenancy in this county has experienced a slight gradual increase since 1880, but 4.14% is still a low figure for tenant-operated farms. By actual calculation of the total number of tenants and owners in the Town of Newton in 1927 a percentage of 4.49 was found, which indicates that the area of this study is typical of the whole county.

This study of land tenure is based on data obtained from 201 farm occupiers in Newton Township. It was impracticable to get full information on every farmer in the Township in the time available for this study.

Nationality and Nativity of the Farmers

Table II shows that this is predominantly a German community. The Poles are grouped rather compactly in the southeastern corner of the township and are generally referred to as the "Polish settlement." The Irish likewise are grouped by themselves in the southwestern corner of the area and form part of a much larger settlement to be found in adjacent townships. With the exception of the Russians, who have come in within the last 15 years, all these nationalities have been resident in their respective areas since the first settlements. Some intermingling of nationalities has taken place, particularly at the borders of the first settlements, but the amount is negligible.

TABLE II. NATIONALITIES OF 201 FARMERS IN THE TOWNSHIP OF NEWTON, MANITOWOC COUNTY, WISCONSIN

Nationality	Number	Per Cent.
Total	201	100.0
German	155	77.1
Polish	31	15.4
Irish	9	4.5
Bohemian	2	1.0
Russian	2	1.0
Scotch	1	0.5
Norwegian	1	0.5

Classification according to nativity reveals the pronounced stability of the agricultural population of this region, for ⅔ of the farmers interviewed were born in Newton Township. In other words, these farmers are not "foreign born" in the sense that this term is used in the federal census, for nearly all of the present farm operators are the third generation on the land. The majority, if not most, of their parents were born in the United States. (Table III.)

Further analysis of the nativity data shows that 12 of these 201 farmers were born in the city. Of course, this number

TABLE III. NATIVITY OF 201 FARMERS IN THE TOWNSHIP OF NEWTON, MANITOWOC COUNTY, WISCONSIN

Places of Birth	Number	Per Cent.
Total	201	100.0
In the Township of Newton	134	66.6
In other parts of Manitowoc County	47	23.4
In other parts of United States	4	2.0
Abroad	16*	8.0

* Of these 16, seven were born in Germany, seven in Poland and two in Russia.

is not large, yet it is significant especially in a region where the farm population is so largely recruited from the sons or other relatives of farmers as will be noted later. It indicates that the movement of people to the farms is not a mere accident. It gives a clue to the number of city people who have been going out on farms, representing a city-to-farm movement which is generally ignored in the lamentations over the drift from country to city.

In view of this high degree of stability in the population it is natural to ask how men climb the "agricultural ladder" in a region where so few farmers rent land and so many seem to step directly into ownership of the land they operate. The pre-ownership steps are grouped under three headings in this study: the inheritance step; the wage-earning step; and tenancy.

I. The Inheritance Step

Examination of the data obtained from the 201 farmers shows that they fall into two distinct groups. One group never left the home farm at all, but worked in cooperation with their parents without wages until the parents retired from active control of the farm operations and the sons stepped into full ownership of the farm at that time or at the death of the parents. In seven cases a few years of renting intervened between the first stage and full ownership. It is extremely interesting that 97, or 48.3%, obtained their farms in this way. These men were willing to stay at home without wages because they were anxious to remain farmers and because they expected to inherit the home farm or receive financial assistance from their fathers when they rented or purchased other farms. An arrangement of this kind suggests a sort of old-world patriarchal relationship between parents and children. Naturally the age at which these men obtained their farms is apt to be somewhat advanced. An extreme example is one farmer who worked at home without wages until he was 61 years of age. His father, by the way, holds the record for the length of ownership of a farm in the Town of Newton, having owned it for 60 years.

This method of acquiring ownership of a farm shows the importance of inheritance in this community. It also helps to explain the relative stability of the agricultural population.

II. The Wage-Earning Step

The second group acquired farm ownership by working for wages to earn money for the renting or purchase of land. One hundred and four, or 51.7%, of the 201 farmers interviewed worked for wages either at home or elsewhere. The average age at which these men began to work for wages was 19.03 years. For the purposes of this study this wage-earning group has been further subdivided (Table IV).

Working for Wages on the Home Farm. It includes first of all those who have worked for hire on the home farm. But the very small proportion of the wage-earning group who used this method of acquiring land ownership shows the relative unimportance of this step in this community. It contrasts significantly

with the large percentage of all farmers who remained on the home farm without wages waiting to acquire farm ownership by inheritance.

Working for Wages on Other Than Home Farm. The size of this group indicates the importance of the "hired-man stage." Use of this method of accumulating the purchase price of a farm seems quite logical. Those who climb by this step do not have to learn a new trade or experience the lower earning capacity that often accompanies a change of occupation. Furthermore, they have an opportunity to gain experience from other farmers. The length of time spent as farm hands seems not to differ greatly between those working for wages on the home farm and on another's farm (Table IV). Since the World War, however, the number of hired men in the township has decreased materially, only 20 having been employed in the entire township in 1927, whereas years ago most of the farmers had hired men.

Working for Wages in Other Rural Occupations. According to the data collected in this study, this step seems to be the most important in Newton Township. Over 27% of all the farmers interviewed had experience in other rural occupations than agriculture. Table V lists the various occupations in which these men were employed. It will be noted that the total given in the table exceeds the number of farmers who used this stage in their progress to ownership (Table IV). This is caused by some of these individuals having been employed at one time or another in more than one of the occupations listed. The greater average duration of this stage is noticeable.

The large numbers in the laborer and carpenter groups warrant further consideration of these occupations. A rural laborer is one who performs such unskilled labor as cutting firewood in winter, digging ditches and other similar work which is not usually classified as "farm labor." The 20 who were employed as rural laborers at some time in their experience followed this occupation for an average of 3.47 years. Carpentering, on the other hand, was followed by 17 wage-earners for an average of 9.3 years. The longer period during which carpenters remained in that occupation was probably the result of the greater earnings and desirability of that work together with stepping up from laborer to carpenter on the part of many. Carpentering was particularly important as a means of accumulating money for the purchase of land in the earlier years. A great deal of building took place in the eighties and nineties when new houses and barns superseded the out-of-date log houses and farm structures. Very little construction, however, has been done since the World War in this township.

Work of this kind had many advantages for farm boys. Many of these occupations, especially carpenter, mason and others, gave them experience which

TABLE IV. RELATIVE IMPORTANCE OF DIFFERENT WAGE-EARNING ACTIVITIES

Method of Acquiring Farm Ownership	Number*	Per Cent.	Average Number of Years in Wage-Earning Stage†
On home farm.....	4	3.84	5.88
On other farms.....	45	43.27	5.32
Rural occupations.....	56	53.84	8.33
Urban occupations....	33	31.73	11.81

* The larger number (138) listed here is accounted for by the fact that several of those using this rung of the "ladder" had experience in more than one wage-earning group.

† The figures in this column represent the average of the time spent in the different wage-earning activities by the respective groups who engaged in these activities.

Assuming that each of the 104 individuals passed through all four of these wage-earning stages a very different result is obtained. Such a calculation shows the average length of each stage as follows: On the home farm, .23 years; on other than home farm, 2.3 years; in other rural occupations, 4.49 years; and in urban occupations, 3.69 years. The total average period is then 10.71 years.

TABLE V. NUMBER OF FARMERS ENGAGED IN OTHER RURAL OCCUPATIONS THAN FARMING PRIOR TO TENANCY OR OWNERSHIP IN TOWNSHIP OF NEWTON, MANITOWOC COUNTY, WISCONSIN

Occupations	Number
Total	64
Laborer	20
Carpenter	17
Lumberjack	4
Housewife*	4
Cheesemaker	4
Mason	3
Blacksmith	2
Threshing	2
School Teacher	2
Soldier	1
Clerk	1
Milk Tester	1
Saloon Keeper	1
Domestic†	1
Adventurer‡	1

* The occupation, "housewife," refers to the period during which present female farm owners (widows) were the wives of the immediately previous owners while the latter were alive.

† One present female farm owner was engaged in housework for hire before she was married.

‡ This man for a time hunted big game in Africa and also joined in the gold rush to Alaska in 1898.

was useful to them later as farmers. The men could always be at home on Sundays or at times when the farm work was especially urgent. If they worked in the cities, such an arrangement was not always practicable. This was more often the case in the past than at present when good roads and the automobile have eliminated distances. Now many farm boys are employed in near-by cities and come home every night.

Working for Wages in Urban Occupations. It sounds somewhat paradoxical to say that working for wages in urban industries is becoming of greater significance as a rung on the "agricultural ladder." Yet over 16% of all the farmers interviewed spent some part of their pre-ownership period in city occupations, while accumulating money for the purchase of a farm. The occupations followed by these men were also diverse, but that of unskilled laborer predominated (Table VI). There is a larger total, as in the previous table, because some of the individuals engaged in several kinds of work. The average time spent in city occupations was 11.81 years, a comparatively long period. But the 24 in the laborer group were engaged in this capacity for an average of 13.41 years. The longer priod spent in the unskilled laborer occupations by the city workers, as compared with the rural laborers, results primarily from the fact that a great many more carpenter jobs than unskilled laborer jobs were available in the country, whereas in the city the unskilled laborer jobs were most plentiful.

This particular rung of the "agricultural ladder" is of more than passing significance. In the first place, it often means a complete separation from farm work and is in no sense an apprenticeship in agriculture, except probably in a few cases. No doubt many of those who leave the country for the city never return because they become attached to the city by their work and associations. On the other hand, the figures just quoted show that an appreciable number who seem to drift to the city do not make urban life their goal but use it as a step to farm ownership. These 33 men (Table IV), after an average of almost 12 years of city life, returned to the farms. To these must be added the 12 who were city-born but who selected

TABLE VI. NUMBER OF FARMERS ENGAGED IN DIFFERENT CITY OCCUPATIONS PRIOR TO TENANCY OR OWNERSHIP, TOWNSHIP OF NEWTON, MANITOWOC COUNTY, WISCONSIN

Occupations	Number
Total	38
Unskilled laborer	24
Domestic	3
Student	2
Mechanic	2
Saddler	1
Bartender	1
Livery driver	1
Tailor	1
Insurance agent	1
Butter business	1
Carpenter	1

farming as an occupation. This phase of the "agricultural ladder" merits further study. The fact that they engaged in unskilled occupations almost exclusively while in the city may be an additional impetus to return to the farms.

Of the 104 who worked for wages 37 had considerable periods of unemployment after they started to work for wages and prior to becoming an owner or tenant. The period of unemployment for these 37 men averaged 4.32 years. Most of these years of unemployment were spent at home on the farm. This matter of unemployment has not been given much consideration in studies of tenure and of progress in acquiring a farm.

III. Tenancy Step[4]

As stated earlier in this article, the percentage of tenancy in this township is about 4½%. Yet of the 201 farmers upon whom this study is based 18 had been, or are, tenants now. Of these, two are renting farms at the present time.[5] In other words, eliminating the two present tenants,[6] 8.04% had used tenancy as a step to land ownership in a region with only 4½% of tenant-operated farms. This means that the percentage of tenancy noted by the United States Census does not give an adequate measure of the number or percentage of farmers who have used tenancy as a step on the "agricultural ladder." The census figures represent a cross-section of tenure at a given time, the other represents the prevalence of renting as a means of acquiring landed property. The average age at which these 18 men became tenants was 28.56 years.

The situation with respect to the relationship of tenants to their landlords is similar to that of present owners to former owners. Eight of the tenants were sons of their landlords, four were (or are) sons-in-law whereas six were not related. These figures agree fairly well with the figures on the relationship of tenants presented by the 1925 federal census for Manitowoc County. According to the census 58.9% of all cash tenants and 73% of all other tenants were related to their landlords in this county. The stability of the population will become very much more apparent when the above facts are considered in connection with the age at which the 199 farmers became owners, a little later in our discussion.

The average size of the farms of the 18 renters was 94.81 acres. This is a little larger than the average size of farms operated by owners and somewhat larger than the average size of farms for the entire township.

The average length of time spent in the tenancy stage by the 16 who completed this stage was 7.56 years. The two who are now tenants must, of course, be omitted because their period of tenancy is not yet finished. This period of almost eight years was less by 2½ years than the duration of tenancy of 30 owner-operators in Illinois,[7] an indication of the more rapid rise to ownership in the Wisconsin area.

[4] For the remainder of this article we shall consider the farmers as a whole instead of the two separate groups.

[5] The low distribution of present tenants among the 201 farmers studied as compared with the total number of tenants in the township (12) need not be confusing in considering the conclusions with respect to tenancy because the 201 farmers studied included enough who had used tenancy *at one time or another* (18) so that they should be fairly representative of the tenancy practices that have been followed in the township.

[6] The two men now renting farms are eliminated because it cannot be ascertained yet whether their tenancy is a permanent status or a step to ownership. Presumably, however, on the basis of past history of tenancy in this region, these two men will eventually become owners. This would raise the proportion of those using tenancy as a step to ownership to 8.95%.

[7] Ten Haken, *op. cit., supra* n. 1, p. 194.

Age of Becoming an Owner

Chart I, derived from a frequency distribution table, shows the number who became owners at different ages. The presence of the two existing tenants makes the total number of instances recorded in the chart 199 instead of 201.

A clearly marked modal average appears in the class interval 25 to 25.9 years. Noteworthy also are the next six years during which 77 men, or over 38% of the total recorded, became owners of farms. Also the 21st year at which men reach their majority and the two years preceding 25 are important ages. However, a considerable number do not become farm owners until they are 40 and even 50 years of age, a reflection of the importance of inheritance. The arithmetic average is 30.06 years, or 5 years less than the average age of acquiring ownership in the Illinois township studied.

Relationship of Present Owners to Former Owners

One of the very interesting facts revealed by this study is the great number (68.85%) of present farm owners who are related to the immediately previous owners. This helps to explain the rather distinctive manner of climbing the "agricultural ladder" and the stable tenure that exist in this locality. The distribution of relationships to former owners of the 199 present owners is presented in Chart II.

This does not tell the entire story of the effect of family connection in strengthening and perpetuating possession of the land by the same group. It will be remembered from Table III that

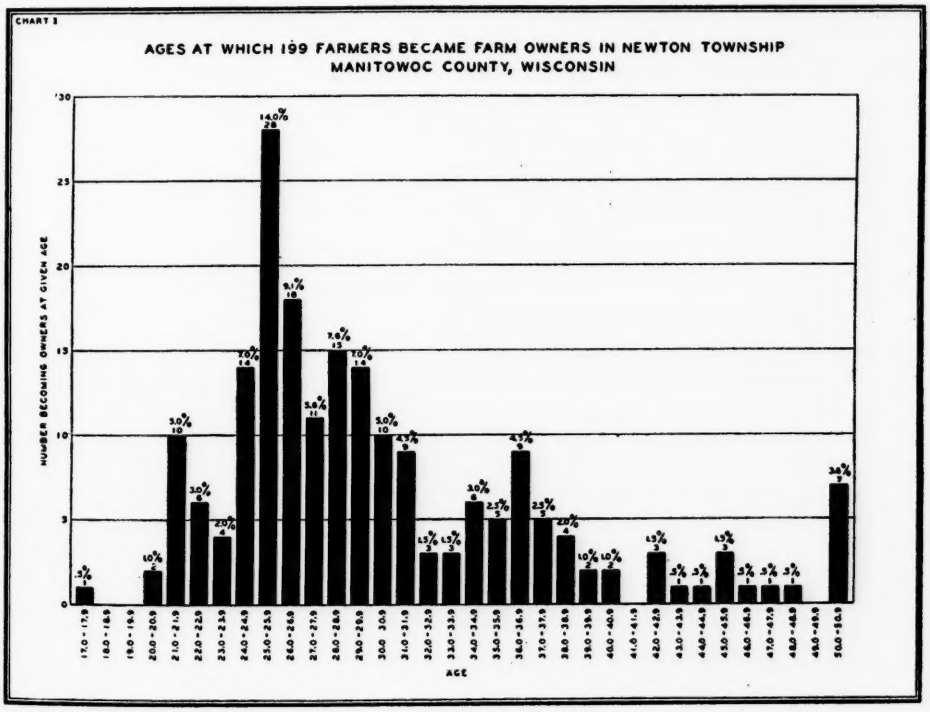
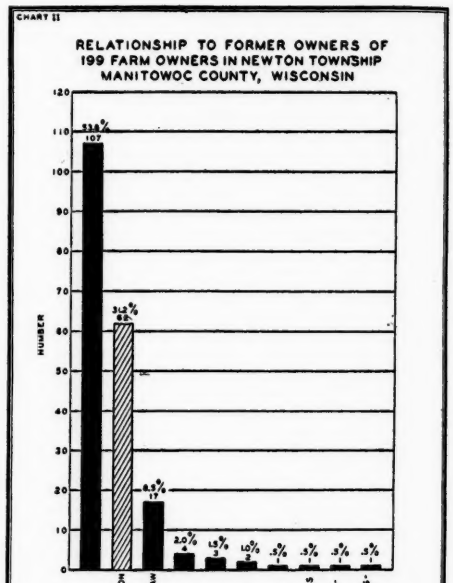


CHART I
AGES AT WHICH 199 FARMERS BECAME FARM OWNERS IN NEWTON TOWNSHIP
MANITOWOC COUNTY, WISCONSIN
NUMBER BECOMING OWNERS AT GIVEN AGE
AGE

134 of the 199 farm owners studied were born in the Town of Newton. Excluding from this group the 99 who were born in the Township and who also inherited their farms from relatives (there were 38 more who inherited their farms from relatives, as shown by Chart II, but these were not born in Newton), 35 are still left who were born in the Township. This indicated that 35 men were not able to inherit farms from near relatives, but received aid from home which helped them to buy farms from unrelated neighbors. In short, *inheritance* took other forms than a direct transference of the home farm to a son or daughter. Further analysis of the data gathered in this township and to be published later substantiates the above thesis.



Is the Duration of the Pre-Ownership Period Increasing?

The question is often asked, "Does it take a longer time to become the owner of a farm at present that it did years ago?" In other words, has the period of the pre-ownership stage increased or decreased? As far as the Town of Newton is concerned, not much change appears to have taken place in these respects during the life-time of the farmers studied, who range in age from 22 to 75 years. To test this, the 201 farmers were divided into three age-groups, and each group was studied separately with respect to the number and percentage of those who worked for wages, the average age of starting work for wages, and the average age of becoming an owner. The data are given in Table VII.

It will be noticed that the number who worked for wages (in terms of percentage) and the average age of becoming an owner decreased appreciably from the oldest age class to the youngest. These figures should not be taken at their face value because the use of the arithmetic average results in averages that are higher than normal on account of the extreme and unusual items in the series. But more important than this is the fact that the figures for the older groups are higher by the very nature of the grouping. The "over-60-years" group includes all the men who became owners before 41 years (just as the first group does) but also all those who became owners much later in life while the "under-41-years" group cannot include men more than 41 years old. It is the laggards who bring up the average for this group, whereas the younger group contains only those who made a rapid climb to ownership.

One might say that the group under 41 years of age *are* owners and should be given credit for their accomplishments. But a fair comparison would require that the ownership status of the "over-60" group be ascertained when

TABLE VII. 201 FARMERS OF NEWTON TOWNSHIP, MANITOWOC COUNTY, WISCONSIN, CLASSIFIED INTO THREE AGE GROUPS BY SIZE OF GROUP, WORKING FOR WAGES, AGE OF STARTING WORK FOR WAGES AND AGE OF BECOMING FARM OWNERS

AGE GROUPS	SIZE OF GROUP		WAGE-EARNING PERIOD		AVERAGE AGE OF BEGINNING WAGE-EARNING PERIOD (YEARS)	AVERAGE AGE OF BECOMING OWNER (YEARS)
	Number	Per Cent.	Number	Per Cent. of Total Number in Age Group		
Total	201	100.0	104	.....	.....	.....
Under 41	57	28.3%	27	47.3%	20.1	26.8
41–60 years, inclusive	91	45.3%	47	51.6%	18.0	28.1
61 years and over	53	26.4%	30	56.6%	18.97	40.2

these men were less than 41 years of age or when the youngest group had reached the age of 61. In the first case all those who were still tenants or wage-earners at the age of 40 would be eliminated from the "over-60" group, while in the second case all those who joined the ranks of owners after 41 but below 61 would be enumerated.

The figures giving the average ages of starting to work for wages seem to support the contention that no appreciable change has taken place in the duration of the wage-earning period. Since all men begin to work for wages before the age of 41, the average age at which men begin their work for money is not influenced by their age at the time the data were obtained. It will be seen that the group under 41 years of age started to work at an average age of 20.1 years; the intermediate group, whose ages lie between 41 and 60, inclusive, began at an average age of 18 years; whereas the group now over 60 years of age began at an average age of 18.97 years. These figures show no appreciable change that may not be caused by the smallness of the sample. It is admitted, however, that the data in Table VII might be more conclusive as proof that little change has taken place in the length of the pre-ownership period in the Town of Newton.

In conclusion, this study indicates that in a low tenancy area the inheritance and wage-earning steps to ownership of landed property are used to practically an equal extent. Acquisition of farm ownership is further aided in Newton Township by a low interest rate on farm land,[8] lower land values, and smaller farms than in the high tenancy area of Knox County, Illinois. Inheritance and low interest rates are directly related to a stable, well-established farm population.

[8] Rozman, *op. cit.*, *supra* n. 3. "In 1920 the rate in this section ranged from 4.6% to 5.0%. No other area enjoys such low mortgage interest." (The last statement embraces the United States.)

DEPARTMENTS

The departments of the JOURNAL are edited specifically with regard to their interest to the readers who are especially concerned with the economic problems of land and public utilities. For the most part the material for the departments will be prepared by members of the staff of the Institute for Research in Land Economics and Public Utilities.

SUMMARIES OF RESEARCH

In this department are given brief accounts of investigations in progress and statements of tentative conclusions reached in the course of work by the staff of the Institute and others associated with the Institute's work.

Cost of Railway Capital ..... *Herbert B. Dorau* 427

Public Utility Financing During the Second Quarter of 1928 ..... *Peter Leininger* 428

COMMENTS ON LEGISLATION AND COURT DECISIONS

Here the readers of the JOURNAL will find a miscellany of summaries and interpretations of recent legislation, court decisions, and documents that have economic significance in land and public utility problems.

Forests and Flood Control ..... *George S. Wehrwein* 431

BOOK REVIEWS

This department contains critical reviews and brief notices of books, and a digest of current literature in urban land economics and public utilities.

JOHN G. THOMPSON, "Urbanization: Its Effects on Government and Society" ..... *Coleman Woodbury* 433

ORREN C. HORMELL, "Electricity in Great Britain—A Study in Administration" ..... *E. O. Malott* 434

Current Literature Notices 437

Urban Land Economics .... *Compiled by Coleman Woodbury*

Public Utilities ..... *Compiled by L. Duane Jennings*

Index to Volume IV 441

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SUMMARIES OF RESEARCH

COST OF RAILWAY CAPITAL

THE steady downward trend of the cost of railway capital was more marked in the first half of 1928 than in the preceding half year, as shown by carrying forward the previous analysis[1] of data from the Interstate Commerce Commission on security issues. In the first quarter of 1928, the average cost of capital secured from the sale of all classes of securities at the price to the company was 4.73%, and in the second quarter 4.72%, compared with 5.06% for the year 1927, and with 5.24% and 5.16% respectively for the first and second quarters of 1927 (Table II).

These current yields on all railroad securities reflect the predominance of low yield bonds and equipment trusts. The cost of money secured by bond issues fell from an average of 5.16% in 1927 to 4.71% in the first quarter of 1928, and 4.75% in the second quarter. Nothing like the same drop occurred in equipment trusts, but the cost of money for this type of security also declined sharply.

At the time of this writing, the Interstate Commerce Commission Report for 1928 is not at hand, and the return earned on investment and on stock in 1927 is therefore not available for comparison with the current cost of money. However, in the period since 1920, there has been a significant increase in the average return earned. This, together with the decline in the cost of money, has brought the average cost of new capital practically to the same level as the return earned on all capital, although for the entire period the average earnings have never yet approached cost of capital (Table II).

[1] H. B. Dorau, "Cost of Railway Capital Under the Transportation Act of 1920", *3 Journal of Land & Public Utility Economics*, 1-20 (February, 1927); 3 *Ibid.*, 427-430 (November, 1927); and 4 *Ibid.*, 206-208 (May, 1928).

TABLE I. SUMMARY OF COST OF FINANCING EXPRESSED IN VARIOUS WAYS, BY YEARS AND FOR THE PERIOD 1920–1927.

YEAR	ALL CLASSES				BONDS				EQUIPMENT TRUST CERTIFICATES				MISCELLANEOUS			
	y–o	z/x	z/n	Yield Difference	y–o	z/x	z/n	Yield Difference	y–o	z/x	z/n	Yield Difference	y–o	z/x	z/n	Yield Difference
1920....	3.66	3.66	3.80	.52	3.47	3.47	3.59	.50	3.98	3.97	4.13	.56	.....	.....	.....	.....
1921....	4.38	4.51	4.72	.47	4.54	4.68	4.91	.50	2.44	2.44	2.50	.08	2.68	2.78	2.86	.39
1922....	3.25	3.36	3.48	.29	3.55	3.69	3.83	.26	2.28	2.30	2.35	.35	.....	.....	.....	.....
1923....	2.54	2.59	2.66	.32	2.65	2.74	2.82	.16	2.55	2.58	2.65	.38	1.51	1.52	1.55	.67
1924....	2.67	2.73	2.80	.24	3.16	3.26	3.37	.23	1.86	1.88	1.91	.08	1.71	1.71	1.74	.86
1925....	2.49	2.55	2.62	.24	2.74	2.82	2.90	.23	1.75	1.76	1.79	.31	4.75	4.80	5.04	1.20
1926....	2.23	2.28	2.34	.20	2.62	2.69	2.77	.18	1.48	1.50	1.52	.24	1.00	1.01	1.02	.54
1927....	2.39	2.46	2.53	.16	2.60	2.70	2.77	.16	.66	.66	.66	.10	2.00	2.02	2.06	.74
1920–27.	2.82	2.89	2.97	.27	3.16	3.26	3.37	.25	2.03	2.05	2.09	.26	1.69	1.71	1.74	.78
1928																
1st Q..	2.02	2.05	2.10	.14	2.19	2.23	2.28	.12	.56	.56	.56	.09	1.75	1.76	1.79	.65
2nd Q.	2.32	2.38	2.44	.13	2.47	2.54	2.60	.13	.67	.68	.68	.11	.....	.....	.....	.....

y–o is the difference between average price received by the company and the average price per hundred paid by the investor.

$\frac{z}{x}$ is the ratio of the banker's share to the value of the issue or issues at the price at which the investor absorbed them.

$\frac{z}{n}$ is the ratio of the banker's share to the actual dollars received by the company.

Yield difference—difference between yield per dollar to maturity at price to the Company, and at price paid by the investor.

TABLE II. RELATION OF COST OF FINANCING TO TOTAL COST OF CAPITAL AND TO RETURN EARNED ON INVESTMENT.

YEAR	COST OF CAPITAL								RETURN EARNED ON	
	All		Bonds		Equipment Trust		Miscellaneous			
	Cost of Financing*	Cost of Capital†	Cost of Financing*	Cost of Capital†	Cost of Financing*	Cost of Capital†	Cost of Financing*	Cost of Capital†	Investment	Stock
1920	.52	7.29	.50	7.34	.56	7.28	.....	7.01	.06	5.45
1921	.47	7.21	.50	7.23	.08	6.76	.39	7.64	2.96	3.94
1922	.29	5.86	.26	5.92	.35	5.71	.....	6.00	3.74	4.85
1923	.32	5.61	.16	5.38	.38	5.72	.67	6.45	4.56	6.95
1924	.24	5.54	.23	5.61	.08	5.27	.86	6.11	4.44	6.70
1925	.24	5.45	.21	5.63	.31	5.06	1.20	5.20	5.00	8.19
1926	.21	5.24	.18	5.36	.24	4.97	.54	5.26	5.15	9.44
1927	.16	5.06	.16	5.16	.10	4.61	.74	5.68	.....	.....
Average	.27	5.67	.25	5.74	.26	5.43	.78	6.06	3.78	6.54
1928										
1st Quarter	.14	4.73	.12	4.71	.09	4.37	.65	5.64	.....	.....
2nd Quarter	.13	4.72	.13	4.75	.11	4.43	.....	4.71	.....	.....

* Difference between yield per dollar to maturity at price to the company, and at price paid by the investor.
† Yield per dollar on securities for which price to the company is available.

This lower over-all cost of money has been manifest both in a lower interest rate, and in lower financing costs; that is to say, the banker's share has declined with the decline in average yields. The steady downward trend has been as marked in the one as in the other, and this is practically true, no matter which method of computing cost of financing is adopted (Table I). Whereas in 1927 the share of the bankers for their services was 0.16 cents per dollar per year to the maturity of the security (by the yield difference method), this charge had fallen in the first quarter of 1928 to 0.14 cents (by the yield difference method), and in the second quarter to 0.13 cents. The differentials for bonds and for equipment trust certificates were slightly higher in the second quarter than in the first quarter of 1928; and for equipment trusts the average is about the same as for 1927.

For convenience in comparing these capital costs with return earned, a consolidated table (Table II) has been compiled to bring together the significant results for the entire period of railway operation under the Transportation Act, i. e., May, 1920, to July, 1928.

The lower over-all cost of capital has been paralleled by lower cost of financing —a satisfactory indication not only of the amount of capital seeking investment, but also of the improved credit position of the railway industries as a whole.

H. B. DORAU

PUBLIC UTILITY FINANCING DURING THE SECOND QUARTER OF 1928

A NOTEWORTHY feature of public utility financing not only in the second quarter of 1928, but throughout the period from 1919 to date, is the steady decline in the yields on preferred stock. Whereas preferred stocks were always 7 "per cents" in the early years of the summary, they are now in 1928 below 6% or, to be exact, 5.78% per dollar in the first quarter and 5.66% per dollar in the second quarter (Table I). This evolution shows strikingly the changed position of the public utilities in the money market. In spite of

their enormous expansion in the last decade, lower cost of money is a satisfactory proof of their improved credit position and stability.

The consistent downward trend in yields of preferred stocks has been independent of the volume. Though the volume of preferred stock issues has steadily increased, they have represented varying proportions of total stock issues. Thus, in the first quarter of 1928, preferred stocks were 76% of all stock, and stocks were 21.49% of all public utility issues. In the second quarter, preferred stocks were 38.1% of all stocks, and stocks were in turn 46.04% of all public utility issues. In 1927 preferred stocks were 64.7% of all stock issues, and stocks were 28.5% of all public utility financing.

It will be noted in Table II that the weighted yields on all classes of securities are only a little lower than the yields on preferred stocks. The yield per dollar on all classes of securities in the first quarter of 1928 was 5.09% and in the second quarter 5.18%. For the same two periods in 1927, the yields were 5.43% and 5.34% respectively.

TABLE I. SIMPLE AND WEIGHTED AVERAGE YIELD AT OFFERING PRICE OF ALL NEW PUBLIC UTILITY PREFERRED STOCK ISSUES, 1919–1928

Years	Number of Preferred Issues	Weighted Average Yield	Simple Average Yield	% of Total Stock
1919 *a*	7	7.48	7.16	59.8
1920 *b*	13	7.23	7.38	52.2
1921 *c*	9	7.68	7.47	22.2 *l*
1922 *d*	35	7.09	7.34	41.7
1923 *e*	44	6.96	7.19	58.8
1924 *f*	87	6.93	7.09	45.6
1925 *g*	96	6.70	6.98	61.5
1926 *h*	86	6.73	6.74	44.3
1927 *i*	111	6.04	6.49	64.7
Total	488	6.68	6.91	52.7
1928				
1st Quarter *j*	23	5.78	6.09	76.0
2nd Quarter *k*	35	5.68	6.12	38.1

a Two items omitted because of insufficient information—Total amount $3,250,000.
b Three items omitted because of insufficient information—Total amount $1,594,900.
c A total of $10,463,609 omitted because of insufficient information. Number and value of each item unknown.
d Two items omitted because of insufficient information—Total amount $5,910,000.
e One item omitted because of insufficient information—Total amount $748,386.
f Five items omitted because of insufficient information—Total amount $6,532,800.
g Six items omitted because of insufficient information—Total amount $6,685,000.
h Three items omitted because of insufficient information—Total amount $2,725,000.
i Two issues omitted—no yield given—offer 1 share of common and 1 of preferred—Total amount $24,050,000.
j One item omitted because of insufficient information—Total amount $200,000.
k One item omitted because of insufficient information—Total amount $1,000,000.
l In the total for stock in 1921 appears a sum of items amounting to $13,414,880. The individual items making up this sum are unknown. The amount is distributed between common and preferred on the basis of percentage relationship of items known. Seventy-eight per cent. of total of 11 months, excluding an unusually large item of $8,900,000 occurring in common, is preferred stock. Seventy-eight per cent. of $13,414,880 is $10,463,606. This is added to total preferred stock for the 11 months. The remainder is added to the common.

TABLE II. WEIGHTED AND SIMPLE AVERAGE YIELD AT OFFERING PRICE OF NEW PUBLIC UTILITY SECURITY ISSUES

Year	All Types of Securities						Bonds and Notes	
	All Maturities		Long-Term		Short-Term			
	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield
1919	6.55	6.68	6.21	6.25	6.78	7.03	6.54	6.67
1920	7.55	7.64	7.52	7.59	7.59	7.68	7.53	7.62
1921	7.13	7.47	7.11	7.42	7.27	7.66	7.11	7.45
1922	6.06	6.34	6.03	6.32	6.39	6.53	6.03	6.34
1923	6.04	6.31	5.99	6.26	6.73	6.72	6.11	6.29
1924	6.03	6.14	6.04	6.16	5.97	6.04	5.98	6.12
1925	5.58	5.81	5.66	5.83	5.55	5.86	5.56	5.78
1926	5.53	5.72	5.52	5.70	5.77	5.82	5.44	5.66
1927	5.24	5.61	5.25	5.57	5.11	5.77	5.12	5.57
1928								
1st Quarter	5.09	5.52	5.08	5.45	5.52	5.94	5.14	5.49
2nd Quarter	5.18	5.47	5.14	5.42	5.54	5.62	5.15	5.42
3rd Quarter								
4th Quarter								

TABLE III. INDEX NUMBERS OF VOLUME OF PUBLIC UTILITY FINANCING, 1919–1928*

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
By Months										
January	100	67	55	46	122	112	199	173	259	176
February	48	28	25	47	66	89	172	125	314	220
March	25	27	25	43	94	78	144	115	158	190
April	5	38	25	50	64	112	69	182	165	318
May	15	38	35	150	66	233	103	230	214	203
June	26	20	9	96	92	122	118	181	130	317
July	41	25	115	44	21	104	90	177	97	.....
August	20	11	33	22	40	62	93	58	92	.....
September	54	44	34	147	34	77	110	38	168	.....
October	24	33	33	77	59	112	92	123	261	.....
November	8	21	119	43	161	69	102	136	212	.....
December	20	63	53	54	135	111	153	114	433	.....
By Quarters										
1st Quarter	100	71	61	80	164	162	299	240	424	340
2nd Quarter	27	56	41	172	129	271	168	344	295	487
3rd Quarter	67	47	105	123	55	141	170	159	207	.....
4th Quarter	30	68	119	101	206	169	201	217	528	.....
By Years	100	107	145	212	246	330	373	427	647	.....

*Volume for January, 1919, First Quarter, 1919, and Year 1919 used as basis for computing index numbers for months, quarters, and years respectively. Compiled from the monthly record of new capital flotations of the *Commercial and Financial Chronicle*.

The decline in total volume of public utility financing which might have been expected after the peak of 1927 and the drop early in 1928 failed to materialize. In June the monthly index reached 317 and aided in establishing a new high-mark for the quarter, second only to the record made in the fourth quarter of 1927 (Table III).

At the same time public utility issues constituted a greater proportion of total capital requirements. In 1927 public utility requirements were 30.26% of total financing, and 40.90% of all corporate financing. In the first quarter of 1928 public utility totals were 27.07% of all and 36.29% of corporate; and in the second quarter they were 32.25% of all, and 41.38% of corporate.

Some slight changes occurred in the distribution of issues among utilities. In the first and second quarters respectively, the gas industry was responsible for 12.38% and 9.72% of the total utility issues; gas and electric companies 24.16% and 12.59%; railway and electric companies 20.69% and 28.61%. Other classes did not change appreciably.

PETER LEININGER

COMMENTS ON LEGISLATION AND COURT DECISIONS

FORESTS AND FLOOD CONTROL*

REFORESTATION and the proper handling of forests is not a substitute for engineering works in flood control but should supplement the work of the engineers. In the first place, forests always had a limited influence on the floods of the Mississippi Valley. Not more than 40 % of the Basin was originally in forests and this has been reduced to 20% of the total area. A large part of the present so-called "forest" area is really denuded and "idle land"; the remainder has been made into farms and most of it will remain in this use.

However, the remaining forest land and other land which should be in forests, are important in controlling floods. Floods are the result of a rapid run-off after heavy rainfall; the more water sent into the air by evaporation or transpiration and the more water that can be induced to enter the soil, the smaller will be the "flashy run-off." Secondly, the run-off is responsible for the erosion of the soil which fills the streams with sediment, adds to the volume of the water and to its corrosive power.

Forests break the fall of rain and absorb enormous quantities of water in the litter and humus of the forest cover which gradually percolates into the soil and finally reaches the streams and lakes. Water flowing over the surface in a forest is broken in its flow and little erosion takes place. The capacity of a forest to act in this manner depends upon the kind of forest. A thick stand of small trees and underbrush is more effective than an open stand of mature trees where the humus and small growth have been destroyed by fire. Other vegetation acts in the same way as forests though not as effectively in all cases, especially on steep slopes. The prevention and control of forest fires are therefore of utmost importance in making forests effective in flood control.

A detailed study of the Mississippi Basin was made by the United States Forest Service and the critical areas were mapped and classified into "beneficial," "neutral," and "detrimental." Regions where deterioration by erosion and heavy run-off occur were classed as "detrimental," those which are not the source of heavy deposits of silt and flood waters were called "beneficial," and those which have had some deterioration but are now static or are perhaps improving were called "neutral."[1]

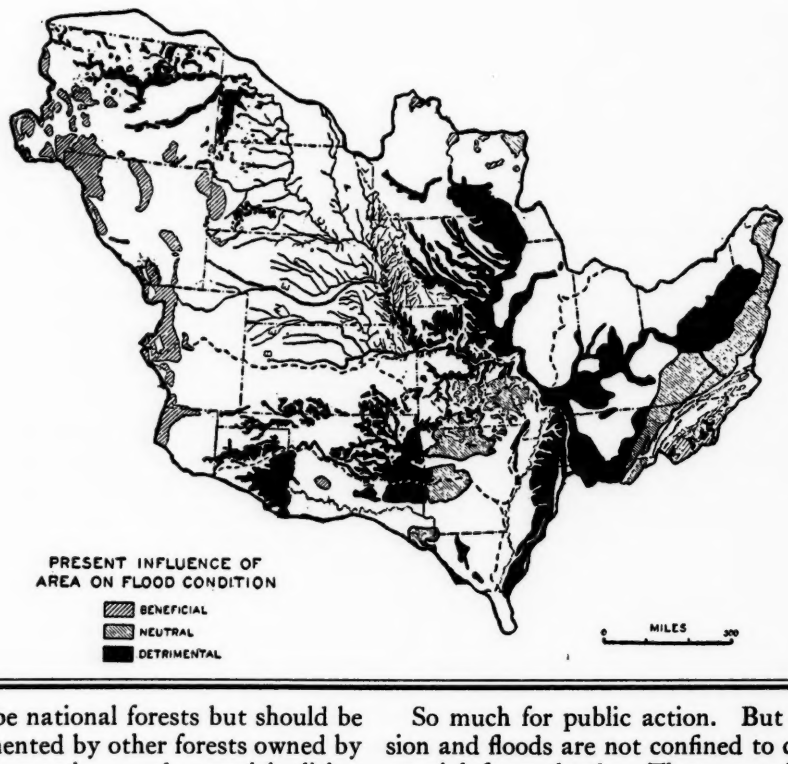
On the basis of this classification various measures were recommended. It is, of course, taken for granted that idle land in farms and submarginal land in general should go back into forest use whether of direct benefit for flood control or not. However, protection forests are recommended in the Appalachian, Ozark and Ouachita Mountains, the Cumberland Plateau, certain critical areas in the South and on the head waters of the Wisconsin (p. 32). These

* Summary of Circular No. 37, United States Department of Agriculture, August, 1928. E. A. Sherman, "The Protection Forests of the Mississippi River Watershed and Their Part in Flood Prevention."

[1] See Fig. 6, p. 20 (or Table 7, p. 44), reproduced here as Chart I.

CHART I

CRITICAL EROSION AREAS IN MISSISSIPPI RIVER WATERSHED



should be national forests but should be supplemented by other forests owned by states, counties and municipalities. Many small critical areas, at present surrounded by agricultural lands, are well suited to public ownership by state and local governments. Game refuges on over-flow lands are recommended, as well as better control over the remaining public domain. The "Bad Lands" of the Dakotas and adjacent states and the "Breaks" of Texas and Oklahoma, although not parts of the forest lands of the United States, are such serious erosion and flood regions that the Forest Service urged further study of them.

So much for public action. But erosion and floods are not confined to commercial forest lands. There are about 115,000 square miles of farm forests in the Mississippi Valley. This land also must be operated in such a manner as to prevent erosion and heavy run-off. For this purpose farmers must be educated to keep steep land in sod and forests, and be instructed in the proper handling of woodlands. Plow land subject to erosion should be terraced. Present aid for forest planting, extension instruction in handling wood lots and the control of erosion should be greatly increased.

GEORGE S. WEHRWEIN.

BOOK REVIEWS

Thompson, John Giffen. URBANIZATION: ITS EFFECTS ON GOVERNMENT AND SOCIETY. *New York: E. P. Dutton & Co., 1927. pp. xiii, 618. $6.*

Anyone who has considered a few of the many problems suggested by the sub-title of this work or who reads the first two chapters on "The Rural Bias" and "The Urban Bent" cannot but admire the courage of the author and look forward with curiosity to the remaining chapters of the 700-page volume. In the first two chapters Mr. Thompson lines up the antagonists. He can show an imposing array in the camp of the agrarians, leading thinkers and prominent writers who from Xenophon to Professor Carver have asserted the superiority of rural life in one or more fundamental regards. On the other side a hardly less imposing group has seen in city life the spring of most that has been valuable in the past as well as present civilizations. Of course, Mr. Thompson does not present the authorities to which he refers as narrow minded disputants but he does indicate rather clearly a decided and unmistakable difference of opinion as to the political and social value of urban living.

With this preliminary survey the examination of evidence begins. The author takes up the historical evidence, particularly as presented in the English language, as to the effect of urbanization on civil liberty, economic freedom, political liberty, initiative and public spirit, efficiency of government, health, physique and natural growth of population, moral standards, religious organization, military preparedness, and social and political stability. He does not limit himself to any age or civilization, but covers in different chapters Greece and Rome, the Middle Ages, modern Europe, and, with greater detail, the United States. His reading has been wide and his specific and accurate references make a splendid bibliography. The attitude of the writer is scholarly and judicial and, therefore, affords a decided relief from the impassioned views of those often conspicuous propagandists who urge that the economic or social welfare of some one occupation or group is of *especial* concern to the nation. Mr. Thompson believes, in general, that the urban community has been painted in too dark shades but no one can accuse him of using whitewash freely. A short excerpt from his concluding chapter is characteristic:

> "That there are in the cities extremely grave problems pressing for solution—problems whose solution will tax the best of human intelligence, ingenuity, and good will to accomplish—cannot be denied. But the country, too, has its seriously grave problems to meet and solve; and by practically universal admission the city is making far more rapid progress than the country in the solution of their respective problems. However, with all possible improvement in both city and country, the former is likely to remain essentially what it is today—with all its extravagances and excrescences a superior center and sphere of human cooperation along the multifarious lines of industry and of political and social organization and activity for which the countryside is not suited, and not least of all for those activities that are carried on within its limits directly in the interest and for the sake of rural life itself."

With these virtues the book has evident shortcomings, many of which were almost unavoidable if the subject were to be covered in one or even two or three volumes. The most conspicuous is the lack of any definition of urbanization or careful distinction of its various forms. The author undoubtedly realizes the dif-

ferent motives and organizations of medieval London and modern New York. Though both are forms of urbanization, he does not clearly show their dissimilarity. He is perfectly aware that urban social organization is not homogeneous. For instance he writes, "These contrasting views appear to afford a very good reason for suspecting that different elements in the urban population and different types of the rural element may differ among themselves, respectively, quite as much as, at times perhaps even more than, the urban population as a whole, with reference to political and social characteristics." Yet the final view is so broad that these significant differences are almost, if not entirely, neglected.

Another, and perhaps more serious result of so sweeping a treatment is the failure to hold to any classification of urban communities by size. Certainly the social and political organization of a "city" of 3,000 cannot be treated or accurately included under the term urbanization with a metropolitan center without some distinction. This form of treatment also neglects the important facts and opinions resulting from Professor Huntington's study of successful and prominent professional and business men from which he concludes "that the sifting power of the cities is bad for rural districts and large cities but good for the small cities." Closely allied to this neglect of population groups is his indifference to a subject which has been so prominent in recent English thought, namely, the question of the most desirable size of cities. This he dismisses by saying, "How much farther the cityward movement may go or when it may have gone far enough, no man nor group of men is wise enough to determine. . . . Human intervention therefore will wisely confine itself to a careful anticipation and application of the means that are best adapted to the purpose of deadening the shock of adjustment that these forces may be relied upon surely, though perhaps somewhat rudely, to make." Such an opinion might be challenged seriously on several grounds but it is cited here merely to indicate a lack of appreciation of what is to many students of urban affairs the most serious problem of urban life.

"Urbanization" seems to be a work that should have been written. It should do much to dispel prejudices and make for more careful and considerate judgments. Its disappointments are perhaps the result of carefully outlining the problem but not the difficulties and limitation of material.

COLEMAN WOODBURY

Hormell, Orren C. ELECTRICITY IN GREAT BRITAIN—A STUDY IN ADMINISTRATION. Supplement to *National Municipal Review. Vol. xvii, No. 6. 25 cents.*

In Great Britain the government has had to step in to bring about the economic development of the electricity supply business. "Approximately two-thirds of the public supply of electricity is in municipal hands" and these local authorities have been handicapped in the building of systems by jealousy among themselves, statutory entanglements in territorial expansion, contributions for the relief of local taxes, "reproduction-cost" purchase valuations, and many lesser conflicts of law and economics. Private distributing companies have been under the burden of inadequate finance, municipal purchase which would break up a system, restricted service area, heavy local taxes, and other minor limitations. These companies have fared little better than the municipals.

Private electric power companies are wholesalers of electricity and conse-

quently have been given larger market areas which are nevertheless limited in size. They have been well protected in operation in that they are not subject to public purchase and they have been accustomed to make contracts covering a minimum period and a minimum return on investment involved. Many of these large power companies have been able to control both the production and the distribution of electricity for certain large industrial areas through the media of stock ownership and interlocking directorates. The integration of control of the power companies extends to electrical equipment and supply companies and to electric utilities in other countries. Yet the British have not used very extensively the American type of holding company.

Great Britain has been behind other countries in the application of electricity, using only about 200 units of electrical energy per capita, while Canada uses 900; the United States, 500; and Belgium, 230. Investigation showed that most of the generating stations were small and uneconomical. To remedy these matters legislation has been passed, culminating in the Electricity (Supply) Act of 1926. Operation under this Act may be briefly summarized.

An Electricity Commission was created by the Act of 1919 and works in cooperation with the Central Electricity Board created by the Act of 1926. The Commission is, in general, the regulatory body. While the private companies are subject to the same general laws as the public companies, their financial report is made to the Minister of Transport. Public companies report to the Commission on prescribed forms. Regulation of rates is secured through the special order originating the "undertaker" which sets maximum rates; a later revision of that order by the Minister of Transport; a sliding scale of dividends and rates for companies purchasing from the Board, subject to approval of both Houses of Parliament; and the extension of the use of the "two-part tariff" at the discretion of the Commission subject to the approval of the Minister of Transport.

In addition, the Electricity Commission administers the technical side of the industry. The Commissioners select the geographical area within which the electrical supply utilities are to be physically integrated and work out technical matters to secure the desired results. These plans are called "schemes."

The "scheme" is presented to the Central Electricity Board which includes representatives (as at present constituted) of private and public electricity companies, labor, commerce and banking. But the financial and industrial interests dominate as this is the side of the "scheme" which the Board is expected to pass upon. The Board may adopt the "scheme" with or without amendment and provision is made to handle complaints of interested parties. The Board is vested with the duty of operating the accepted "scheme," and its position may be likened to that of a wholesaler who has control of the source of supply of commodities handled. The Board wholesales to jobbers who are the local distributing companies (public and private). But the action of the Central Electricity Board is in general under the supervision of the Electricity Commission.

Each "scheme" contemplates the provision of economical generating stations (new or enlargements of existing stations), interconnection of these stations and transmission of the output to local markets for distribution, and the standardization of frequency.

Public purchase of private companies is generally to be on the basis of "prudent investment" valuation, which re-

moves one cause of the uncertainty of unexpected public purchase. Labor problems, such as wages and working conditions, are being handled by the "Whitley Councils" which have been "remarkably successful." In their present experiment with the development of the electricity supply the British "are protecting the *status quo* (1926) with regard to public ownership and private ownership, although it is believed that the incentive for the purchase of private enterprises by local authorities has been greatly weakened if not entirely removed."

Professor Hormell has given an excellent presentation of the administrative mechanism in which he is primarily interested. He makes few comparisons between the United States and Great Britain and does not bring out sharply the underlying technological situation. In Great Britain, a large number of small generating stations have been prevented from keeping abreast of technical progress by the limited jurisdiction of local authorities or the threat of piecemeal public acquisition of a private system. The establishments which have made some progress have been those freed from public purchase restrictions or the very large municipal plants. Local stations could not economically be interconnected heretofore because of the lack of a uniform frequency.

In the development of the present large interconnected systems in the United States, standardization of frequency, of voltage, and of much equipment and practice has been effected. None of these can be said to be standardized throughout the country but over any considerable (electrical) area the statement is true. Where political boundaries have introduced regulative difficulties, the holding company, through control of a company under each jurisdiction, still allows advantage to be taken of engineering economy. All this has been worked out by private initiative under the stimulus of private competition. The Central Electricity Boards of the United States are the holding company managements; the Electricity Commissions are their consulting engineering subsidiaries. That public ownership is not more prevalent in the United States may be partly attributed to private initiative in developing economical electricity supplies in order to be in position to provide service at suitable rates in anticipation of public dissatisfaction.

While Great Britain now finds it necessary to spend money to bring about an economic integration of the electricity supply industry after paying relatively high rates during the past years, the United States has been securing electricity integration and enjoying relatively low rates while so doing.

The Transportation Act of 1920, which proposes the further integration of steam railways, may, however, be regarded as a precedent for the British Electricity (Supply) Act of 1926 but is itself preceded by the British Act of 1919.

The question seems to be one of "what price progress"? Private intiative may get out of hand and require some regulation while public initiative may become strangled and require some stimulation.

E. O. MALOTT

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(Compiled by Coleman Woodbury)

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Index to

THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

VOLUME IV

FEBRUARY, 1928—NOVEMBER, 1928

LEADING ARTICLES

BAYLESS, A. C. Costs and Encumbrance Ratios in a Highly Developed Real Estate Market (H. Morton Bodfish, co-author) 125–138

BICKLEY, JOHN H. Capital and Maintenance Expenditures in Public Utility Accounting 25–44

BODFISH, H. MORTON. Costs and Encumbrance Ratios in a Highly Developed Real Estate Market (A. C. Bayless, co-author) 125–138

BODFISH, H. MORTON. Real Estate Activity in Chicago Accompanying the World's Fair of 1893 405–416

BROOK, GEORGE C. A Cycle in the Economic History of Public Utilities, 1914–1922 301–304

BROWN, HARRY GUNNISON. Should Bare-Land Values Be Taxed More Heavily? 375–392

CURRY, ALBERT S. The Status of Land and Capital in the Elephant Butte Irrigation District (Arthur L. Walker, co-author) 75–84

DE VRIES, WADE. Correlation of Physical and Economic Factors as Shown by Michigan Land Economic Survey Data 295–300

DOZIER, HOWARD D. Present Reasonable Rate of Return for Public Utilities ... 235–242

EMMERICH, HERBERT. The Problem of Low-Priced Cooperative Apartments: An Experiment at Sunnyside Gardens. 225–234

FINK, ORMAN S. Area Requirements of Cities in the Region of Chicago (Coleman Woodbury, co-author) 273–282

FOREMAN, C. J. Agricultural Rent Liens as a Menace to Commerce 157–170

GRANT, EUGENE L. Depreciation—An Operating Expense or an Appropriation of Earnings? 251–257

GRIMES, W. E. Trends in the Agriculture of the Hard Winter Wheat Belt 347–354

HAVLIK, HUBERT F. The Changing Character and Extent of Municipal Ownership in the Electric Light and Power Industry of Missouri 139–146

HEGGIE, HELEN E. Developments in Municipal Ownership of Electric Plants in Minnesota 289–294

JOME, HIRAM L. Property in the Air as Affected by the Airplane and the Radio 257–272

LATTIMER, J. E. Recent Changes in Farm Organization in Western Canada 243–250

LEININGER, PETER. Public Utility Financing, 1919–1927 199–202

LOUCKS, W. N. The Philadelphia Building and Loan Association Plan of Financing by Second Mortgages 367–374

MALOTT, E. O. Integration of Public and Private Electric Plants in Wisconsin .. 355–366

MALOTT, E. O. Technology and the Widening Market for Electric Service . 147–156

MERTSKY, GRACE. The Assessment of Real Estate in Chicago, 1927 71–74

MORRISON, PAUL L. Some Economic Aspects of Public Utility Holding Company Financial Statements: Consolidated Balance Sheets 1–12

MORRISON, PAUL L. Some Economic Aspects of Public Utility Holding Company Financial Statements: Consolidated Income Statements 171–174

PERLMAN, JACOB. Farm Land Requirements for Agricultural Products in Foreign Trade 283–288

PERLMAN, JACOB. The Recent Recession of Farm Population and Farm Land .. 45–58

ROZMAN, DAVID. Land Credit in Walnut Grove Township, Knox County, Illinois 305–312

SICKLER, BARCLAY J. A Theory of Telephone Rates 175–188

SUMNER, JOHN D. Going Value: Its Various Interpretations and Their Validity. 59–70

SUMNER, JOHN D. Going Value: Its Validity and Logical Application 113–124

TEN HAKEN, WILLIAM H. Land Tenure in Walnut Grove Township, Knox County, Illinois 13–24, 189–198

WALKER, ARTHUR L. The Status of Land and Capital in the Elephant Butte Irrigation District (Albert S. Curry, co-author)..... 75–84

WEHRWEIN, CARL F. The Pre-Ownership Steps on the "Agricultural Ladder" in a Low Tenancy Region.....417–425

WINAKOR, A. H. A Study of Utility Financial Structures: Capital Investments and Sources of Capital.....393–404

WOODBURY, COLEMAN. Area Requirements of Cities in the Region of Chicago (Orman S. Fink, co-author).....273–282

WOODBURY, COLEMAN. The Size of Retail Business Districts in the Chicago Metropolitan Region..... 85–91

ZINDER, HANINA. Problems of Rural Electric Service: The Potential Market.....337–346

DEPARTMENT ARTICLES

Amendment of Excess Condemnation Law of New York City.....103–104

California Planning Act of 1927, The....209–212

Cambridge Zoning Decision, The.....322–324

Cost of Railway Capital Under the Transportation Act of 1920, The.....206–208

Cost of Railway Capital.....427–428

Forestry Act of 1927 of the Province of Ontario, The.....100–102

Forests and Flood Control.....431–432

Gross and Net Earnings of Public Utility Enterprises Exclusive of Steam Railway, Telephone and Telegraph Utilities..... 96–97

Municipal Control of An Outlying Land Subdivision.....320–322

National Courts and Local Utilities....318–320

New Jersey Zoning Amendment.....102–103

Public Utility Financing During Third Quarter, 1927..... 97–99

Public Utility Financing During First Quarter, 1928.....316–317

Public Utility Financing During Second Quarter, 1928.....428–430

Some Economic Aspects of the 1927 Tax Burden on Chicago's Street Car Patrons.....314–316

Taxation of Electric Railways, 1920 to 1926..... 93–96

Trends in Electric Production and Revenue.....204–206

BOOK REVIEWS

BRUNNER, E. S., HUGHES, G. S. and PATTEN, M. *American Agricultural Villages*.....218

BRUNNER, E. S. *Village Communities*.....218

DORAU, HERBERT B., and HINMAN, ALBERT G. *Urban Land Economics*.....325

GLAESER, MARTIN G. *Outlines of Public Utility Economics*.....213

HORMELL, ORREN C. *Electricity in Great Britain—A Study in Administration*.....434

POLLOCK, W. W., and SCHOLZ, K. W. H. *The Science and Practice of Urban Land Valuation*.....106

PUBLIC UTILITIES AND CARRIERS SERVICE. *Illinois*.....327

PUBLIC UTILITIES AND CARRIERS SERVICE. *United States Supreme Court; Public Utility Forms; Bibliography*.....326

RIEGEL, ROBERT, and DOUBMAN, J. RUSSELL. *The Building and Loan Association*.....105

TEELE, RAY P. *Economics of Land Reclamation in the United States*.....215

THOMPSON, JOHN GIFFEN. *Urbanization: Its Effects on Government and Society*.....433

BOOK NOTICES

BAILEY, L. H. *The Harvest*.....332

BAKER, NEWMAN F. *Legal Aspects of Zoning*.329

HOLMES, C. L. *Economics of Farm Organization and Management*.....330

KNEIER, CHARLES MAYARD. *State Regulation of Public Utilities in Illinois*.....328

LAUCK, W. JETT. *Political and Industrial Democracy, 1776–1926*.....330

MAULDON, F. R. E. *A Study in Social Economics, The Hunter River Valley, New South Wales*.....331

NORTH, NELSON L., and VAN BUREN, DEWITT. *Real Estate Titles and Conveyancing*.219

REEP, SAMUEL N. *Second Mortgages and Land Contracts in Real Estate Financing*.....220

SCHAFER, JOSEPH. *Four Wisconsin Counties, Prairie and Forest*.....108

SUBJECT INDEX

A

Accounting, public utility
  capital and maintenance expenditures
    additions, defined 27
    allocation of charges 28
    betterments, defined 27
    current maintenance, defined 27
    maintenance, defined 37
    maintenance, relation to depreciation ... 42
    maintenance expenses, equalization of ... 38
  regulation, need for 43
  see also Depreciation accounting, public utility
Agricultural ladder 13, 189, 417
  see Land tenure
Agricultural land
  see Agriculture, trends in Foreign trade; Irrigation
Agricultural population
  see Farm population
"Agricultural Rent Liens as a Menace to Commerce," by C. J. Foreman 157–170
Agriculture, trends in
  in hard winter wheat belt
    costs of production 351
    cropped acreage, changes in 348
    farm home conveniences 353
    improvements, effect of 348, 350
    land values 352
    marketing problems 351
    population changes 353
    prices, effect of 347
  in United States 50
    cropped land 51
    land in farms 51, 52
    relation to agricultural production 54
  in Western Canada
    effect of machinery 245
    number and size of farms 245
    production, increase of 246
    ratio of farms to population 248
  see also Rural electric service
Air rights
  see Property in air
Airplane, relation to property
  see Property in air
Amalgamated Clothing Workers Union
  cooperative apartment experiment 233
"Amendment of Excess Condemnation Law of New York City"* 103–104
"Area Requirements of Cities in the Region of Chicago," by Orman S. Fink and Coleman Woodbury 273–282

*Department articles.

Area requirements of cities in Chicago region
  density factor
    application to future population 281
    conditions affecting 278
    method of calculation 274
"Assessment of Real Estate in Chicago, 1927, The," by Grace Mertsky 71–74
Assessment
  see Real estate

B

Balance sheets, consolidated
  see Financial statements
Bare-land values
  see Taxation
Building and loan financing
  by second mortgages in Philadelphia plan
    cost of money in 369
    is cost excessive 373
    plan described 368
    second mortgage problem 367

C

"California Planning Act of 1927, The"* 209–212
"Cambridge Zoning Decision, The"* 322–324
"Capital and Maintenance Expenditures in Public Utility Accounting," by John H. Bickley 25–44
Capital structures
  see Financial structures
"Changing Character and Extent of Municipal Ownership in the Electric Light and Power Industry of Missouri, The," by Hubert F. Havlik 139–146
Chicago .. 71–74; 85–91; 125–138; 273–282; 314–315; 405–416
City Housing Corporation
  see Cooperative apartments
Cooperative apartments
  advantages and disadvantages 232
  experiments and results 233–234
  Sunnyside
    first group
      buildings, description of 226
      legal organization 227
      payment plan 228
    second group 230–232
"Correlation of Physical and Economic Factors as Shown by Michigan Land Economic Survey Data," by Wade De Vries 295–300
"Cost of Railway Capital"* 427–428
"Costs and Encumbrance Ratios in a Highly Developed Real Estate Market," by H. Morton Bodfish and A. C. Bayless 125–138

"Cost of Railway Capital under the Transportation Act of 1920, The"*.....206–208
Current Literature Notices
Public utilities.....110–111, 222–223, 334–336, 438–440
Urban land economics.....109–110, 221–222, 333–334, 437–438
"Cycle in the Economic History of Public Utilities, 1914–1922, A," by George C. Brook.....301–304

D

Depreciation accounting, public utility
methods, variety of.....251
retirement charges, flexibility of.....252
as appropriation of earnings.....252
defense of.....253
relation to credit.....254
"Depreciation—An Operating Expense or an Appropriation of Earnings?" by Eugene L. Grant.....251–257
Depreciation, public utility
relation to maintenance..... 42
"Developments in Municipal Ownership of Electric Plants in Minnesota," by Helen E. Heggie.....289–294

E

Earnings, public utility..... 96
Electric light and power industry
economic history, 1914–1922.....302
see also Integration of electric plants; Municipal ownership
Electric production
trends in.....204
Electric railways
economic history, 1914–1922.....301
taxation of..... 93
Electric revenue
trends in.....204
Electric service, market for
concentrating control of.....151
development of.....146, 148, 149
expansion of, economic.....151
extension of, physical.....149
Elephant Butte Irrigation District
see Irrigation
Encumbrance ratios, real estate
see Financing, real estate
Excess condemnation
New York City law amended.....103

F

Fair return
see Rate of return
Farm electrification
see Rural electric service
Farm land
see Foreign trade; Agriculture, trends in
"Farm Land Requirements for Agricultural Products in Foreign Trade," by Jacob Perlman.....283–288
Farm mortgages
see Land credit
Farm organization
see Agriculture, trends in; Rural electric service
Farm ownership
see Land tenure
Farm population
changes in, in U. S..... 45
persons gainfully employed in agriculture 46
reflects depression..... 48
relation of electric service to.....337
relation to agricultural production..... 54
changes in, in hard winter wheat belt.....353
changes in, in Western Canada.....246
natural surplus of..... 56
Farm tenure
see Land tenure
Federal Radio Commission.....257, 267, 271
Financial statements, holding company
consolidated balance sheets.....1–12
consolidated income statements.....171–175
Financial structures of public utilities
capital investments.....393–398
sources of capital.....398–404
Financing, public utility.....97, 199, 316, 428
Financing, real estate
costs of, in Chicago market
first mortgages, terms and costs of.....131
liens and equities, relation to sales value.126
land contracts, terms and costs of.....136
second mortgages, terms and costs of...133
costs of, outside Philadelphia.....373–374
Flood control, forests and.....431–432
Foreign trade, agricultural products in
farm land requirements for
method of investigation.....283
net agricultural exports.....284
net agricultural imports.....286
"Forestry Act of 1927 of the Province of Ontario, The"*.....100–102
"Forests and Flood Control"*.....431–432

G

Gas utilities
economic history, 1914–1922.....302
Going value
interpretation of.....60, 61, 63, 67

*Department articles.

item in rate-base....114
"going cost" more accurate....113
nature of....114
relation to valuation standards....119
variety of meanings.... 59
"Going Value: Its Validity and Logical Application," by John D. Sumner, II....113–124
"Going Value: Its Various Interpretations and Their Validity," by John D. Sumner, I....59–70
"Gross and Net Earnings of Public Utility Enterprises Exclusive of Steam Railway, Telephone and Telegraph Utilities"*...96–97

H

Holding companies
see Financial statements

I

Income statements, consolidated
see Financial statements
Inheritance
see Land tenure
Integration of electric plants
in United States
conclusions on....359
effect on public ownership....355
small plants, experience of....358
technological factors....357
in Wisconsin
conclusions on....366
source of output as factor....361
type of station as factor....363
"Integration of Public and Private Electric Plants in Wisconsin," by E. O. Malott. 355–366
Irrigation
in Elephant Butte District
capital.... 81
construction works.... 78
farm development.... 78
investment and indebtedness.... 82
legislation.... 76
production problems.... 80

L

Land contracts
see Financing, real estate
"Land Credit in Walnut Grove Township, Knox County, Illinois," by David Rozman....305–312
Land credit
in Walnut Grove Township, Knox County, Illinois
mortgage loans
annual encumbrance....319
cumulative encumbrance....310
interest rate on....308
length of time in force....308
relation to tenancy....311
sources of....305
see also Irrigation
Land settlement
see Irrigation—in Elephant Butte District
Land speculation
see Taxation of land values
Land subdivision
municipal control of
California statute....210
Michigan case....320
"Land Tenure in Walnut Grove Township, Knox County, Illinois," by William H. Ten Haken....13–24, 189–198
Land tenure
in Newton, Manitowoc County, Wisconsin
age at becoming owner....423
description of area....417
inheritance....419
nativity and nationality of farmers....418
pre-ownership period, increased duration of....424–425
relation of present to former owners. 423–424
tenancy stage....422
wage-earning step....419–422
in Walnut Grove Township, Knox County, Illinois
hired laborer stage....196
nativity of operators and retired farmers. 18
numbers and percentages in different tenure stages....189
ownership, methods of acquiring.... 20
ownership, percentage of.... 17
owner-operator stage....193
part-owner-operator stage....194
related tenant stage....195
retired farmer stage....191
size of farms.... 19
tenancy, percentage of.... 17
unrelated tenant stage....195
Land values
in hard winter wheat belt....352
see also Taxation of

M

Michigan Land Economic Survey
correlation of physical and economic factors in....295
Mortgages, first
see Financing, real estate
Mortgages, second
see Building and loan financing; Financing, real estate

*Department articles.

"Municipal Control of an Outlying Land Subdivision"*.....320–322
Municipal ownership in electric light and power industry
in Minnesota
compared with Wisconsin, Missouri and Massachusetts.....293
origins of municipal plants.....291
purchased current, increased use of.....292
rise of.....289
in Missouri
comparison with Wisconsin and Massachusetts.....145
growth and decline of.....139
origins of municipal plants..... 41
purchased current, increasing dependence on.....141
recession of.....144

N

"National Courts and Local Utilities"*.318–320
Nectow v. City of Cambridge, Massachusetts
see Cambridge zoning decision
"New Jersey Zoning Amendment"*.....102–103
Newton, Manitowoc County, Wisconsin
see Land tenure in; *see also* Land credit, in Walnut Grove Township, Knox County, Illinois

O

Ontario
see Forestry Act

P

"Philadelphia Building and Loan Association Plan of Financing by Second Mortgages, The," by W. N. Loucks.....367–374
Planning
see California Planning Act of 1927; Zoning; Excess condemnation; Land subdivision, municipal control of
"Pre-Ownership Steps on the 'Agricultural Ladder' in a Low Tenancy Region," by Carl F. Wehrwein.....417–425
"Present Reasonable Rate of Return for Public Utilities," by Howard D. Dozier...235–242
"Problem of Low-Priced Cooperative Apartments: An Experiment at Sunnyside Gardens, The," by Herbert Emmerich...225–234
"Problems of Rural Electric Service: The Potential Market," by Hanina Zinder.337–346
"Property in the Air as Affected by the Airplane and the Radio," by Hiram L. Jome.....257–272
*Department articles.

Property in air
affected by communication through air....267
affected by travel through air.....265
basis of regulation of.....260
evolution of.....258
subjacent owner, rights of.....259
modern legislation on
subjacent owner's rights denied.....265
subjacent owner's rights recognized.....263
present status of.....265
Public Service Corporation of New Jersey
balance sheet.....6–7
proposed consolidated balance sheet.....8–9
Public utilities
see Accounting, public utility; Earnings; Electric light and power industry; Electric production; Electric railways; Electric revenue; Electric service; Financial statements; Financial structures; Financing; Gas utilities; Going value; Integration; Municipal ownership; Railway capital; Rate of return; Regulation; Rural electric service; Taxation; Telephone and telegraph utilities; Telephone rates
"Public Utility Financing, 1919–1927," by Peter Leininger.....199–202
"Public Utility Financing," by quarters*...
.....97–99, 316–317, 428–430

R

Radio legislation.....257, 267
Radio, relation to property
see Property in air
Railway capital, cost of
under Transportation Act of 1920.....206
Rate of return
as rate-factor.....236
contemporary with rate-base.....235
reasonableness, criterion for.....237
relation to credit.....240
Rates
see Telephone rates
Ratios, utility financial
property investments.....394
current assets to total capital.....396
investment to total capital.....396
other assets to total capital.....398
sources of capital
capital stock to total capital.....401
current liabilities to total capital.....400
long-term debt to total capital.....398
surplus and reserves to total capital....402
Real estate
assessment of, in Chicago
averages since 1923..... 71

rates of..... 72
rates of, by classes of property..... 73
Real estate
see also Financing, real estate; Cooperative apartments; Building and loan financing; Land subdivision
"Real Estate Activity in Chicago Accompanying the World's Fair of 1893," by H. Morton Bodfish.....405–416
prior to 1893
building activity.....407
operations in acreage.....408
subdivision activity.....407
during 1893
building activity.....411
operations in acreage.....412
rental market.....412
subdivision activity.....411
following 1893.....414
"Recent Changes in Farm Organization in Western Canada," by J. E. Lattimer.243–250
"Recent Recession of Farm Population and Farm Land, The," by Jacob Perlman..45–58
Reclamation
see Irrigation
Regulation, public utility
national courts and local utilities.....318
need for in accounting..... 43
see also Rate of return; Going value; Depreciation
Rent liens, agricultural
evolution of.....157
good-faith purchaser not liable.....161
good-faith purchaser with notice liable for property.....162
good-faith purchaser with notice liable for value.....164
good-faith purchaser without notice liable by statute.....167
good-faith purchaser without notice liable for value.....165
Reproduction cost
see Going value
Retail business districts
size of, in Chicago region
factors in..... 89
method of measuring..... 87
Ridgefield Land Company v. City of Detroit, et al.
see Land subdivision, municipal control of
Rural electric service
future of.....346
history of.....338
market for.....339
estimated farm load.....341
farm power uses.....343
supply of
cost problem.....345
distribution problem.....344

S

"Should Bare-Land Values Be Taxed More Heavily?" by Harry Gunnison Brown.375–392
"Size of Retail Business Districts in the Chicago Metropolitan Region, The," by Coleman Woodbury.....85–91
"Some Economic Aspects of Public Utility Holding Company Financial Statements: Consolidated Balance Sheets," by Paul L. Morrison.....1–12
"Some Economic Aspects of Public Utility Holding Company Financial Statements: Consolidated Income Statements," by Paul L. Morrison.....171–174
"Some Economic Aspects of the 1927 Tax Burden on Chicago's Street Car Patrons"*.....314–316
"Status of Land and Capital in the Elephant Butte Irrigation District, The," by Arthur L. Walker and Albert S. Curry....75–84
"Study of Utility Financial Structures; A: Capital Investments and Sources of Capital," by A. H. Winakor.....393–404
Sunnyside Gardens
see Cooperative Apartments
Subdivision
see Real estate activity in Chicago; Land subdivision, municipal control of

T

Taxation
of bare-land values
compared with ability-to-pay principle..388
confiscation.....383
consequences of.....378
contrasted with general property tax....379
effect on farmers.....390
effect on speculation.....385
incidence of.....375
valuation for.....375
Taxation
see Electric railways; Real estate, assessment of
"Taxation of Electric Railways, 1920 to 1926"*.....93–96
Taxation, electric railway
in Chicago.....314
"Technology and the Widening Market for Electric Service," by E. O. Malott....147–156
Technology
see Integration of electric plants; Electric service

*Department articles.

Telephone and telegraph utilities
economic history, 1914–1922.....303
Telephone rates, theory of
holding time, factor of.....185
influence of competitive price.....178
joint costs and competitive price.....177
joint costs in telephone industry.....176
off-peak rates.....184
readiness-to-serve rate.....181
zone system.....185
Tenancy
see Land tenure
"Theory of Telephone Rates, A," by Barclay J. Sickler.....175–188
Transportation Act of 1920.....206, 427
"Trends in Electric Production and Revenue"*.....204–206
"Trends in the Agriculture of the Hard Winter Wheat Belt," by W. E. Grimes...347–354

U

Uniform State Aeronautics Act.....263
Urban land
see Retail business districts, size of; Area requirements of cities

V

Valuation, land
methods of.....375
Valuation, public utility
standards of and going value.....119–124

W

Walnut Grove Township, Knox County, Illinois
see Land credit; Land tenure
World's Fair, 1893
see Real estate activity in Chicago

Z

Zoning
Cambridge zoning decision.....322
New Jersey amendment.....102

*Department articles.

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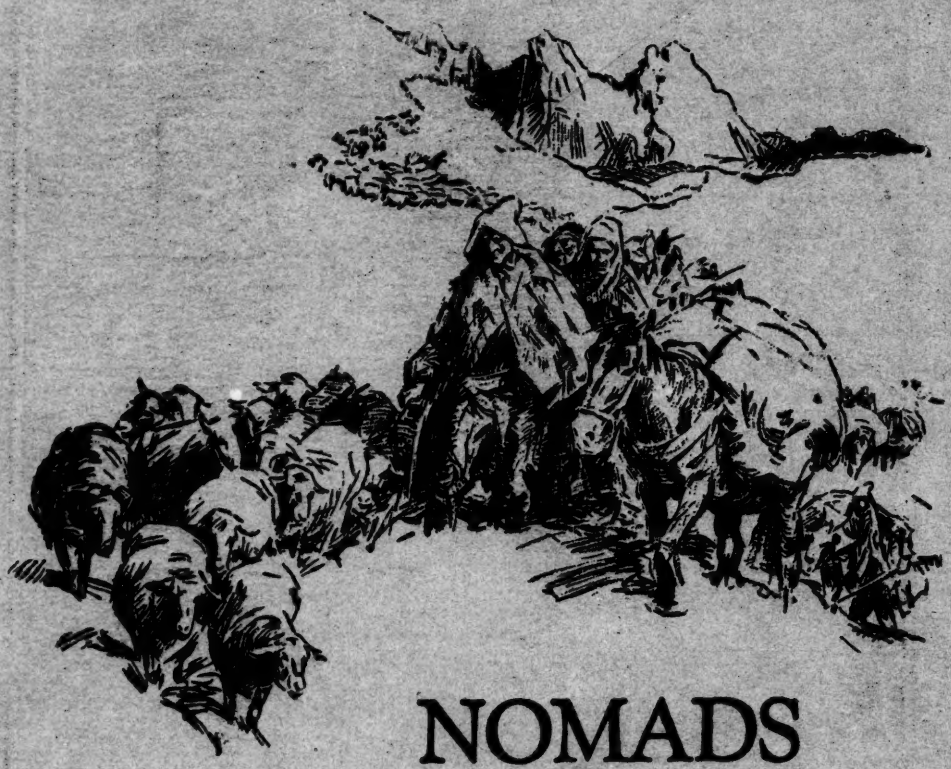

NOMADS

The top of the pass! To-day, just as in the remote Biblical age when herdsmen tended the flocks of Abraham, these nomad tribes drive their flocks each season up from the parched desert to the high table-lands of the Caucasus, green with life-giving grass.

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